ARRIVE 2050

METROPOLITAN TRANSPORTATION PLAN

Plan Document

December 2024

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Introduction

The Bismarck-Mandan Metropolitan Planning Organization

The Bismarck-Mandan Metropolitan Planning Organization (MPO) provides a forum for public officials, citizens, and other interested groups to establish policies and plans for effectively addressing various metropolitan transportation issues. The MPO comprises five jurisdictions, including the cities of Bismarck, Mandan, and Lincoln and portions of Burleigh and Morton counties. **Figure 1** presents the Bismarck-Mandan MPO area.

The MPO and its member jurisdictions work together to carry out a performance-based and multimodal transportation planning process that is *continuing, cooperative, and comprehensive*. The ongoing coordination among the MPO, member agencies, and federal transportation agencies allows for the efficient management of public transportation funds while encouraging public participation in the metropolitan transportation planning process.

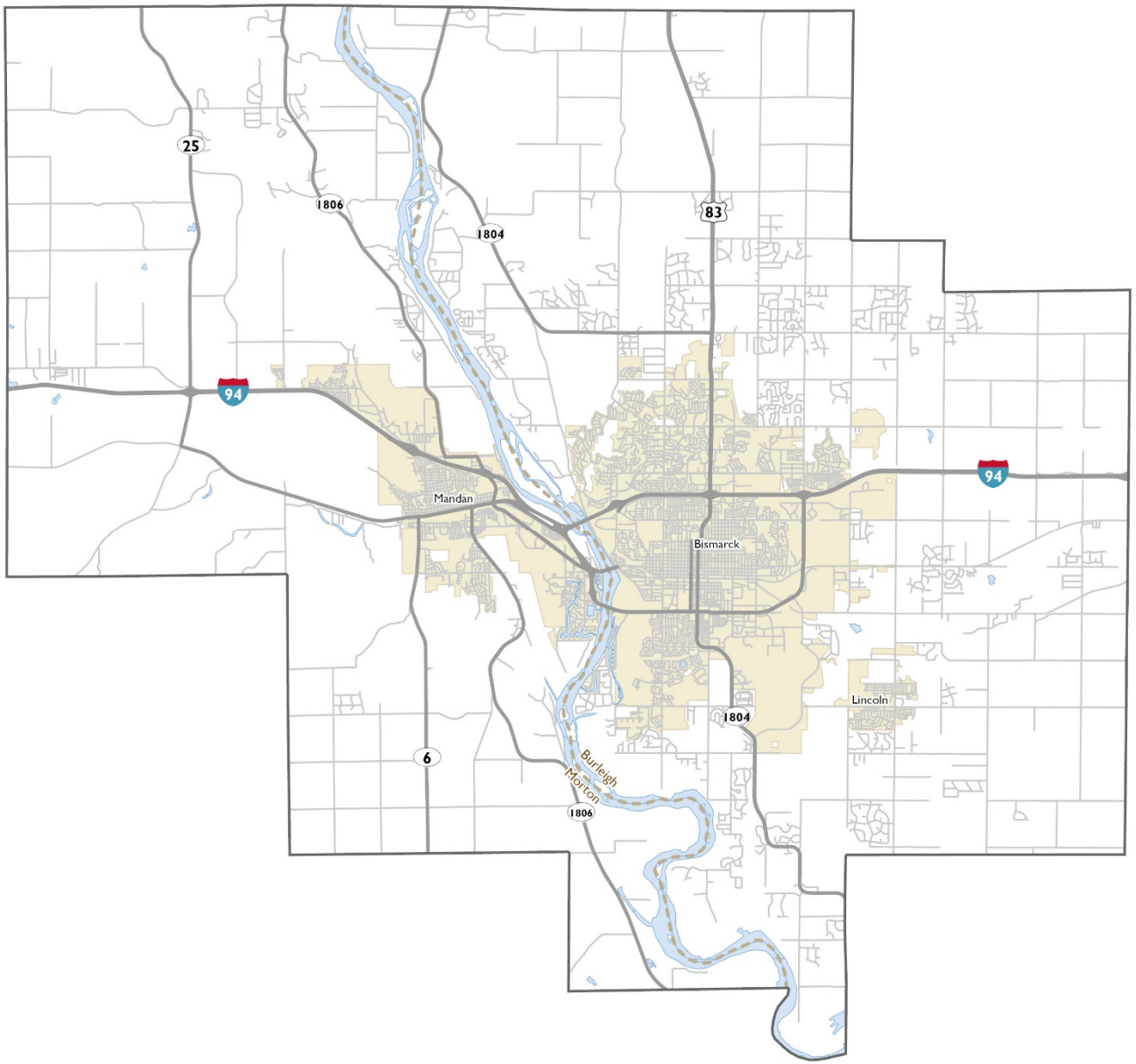
Two committees guide the MPO by providing direction on technical and policy matters:

- **Technical Advisory Committee** (TAC)
- **Policy Board**

In addition to these two committees, the Bismarck-Mandan MPO Bike & Ped Subcommittee serves as an advisor to the TAC and Policy Board. This subcommittee promotes safe, accessible active transportation in the MPO region and comprises professionals from disciplines such as community planning, engineering, local parks and recreation districts, law enforcement, public health, and North Dakota Department of Transportation (NDDOT) representatives.

Technical Advisory Committee (TAC)	Provides recommendations based on professional judgment for the MPO's Policy Board. The TAC comprises planning and engineering staff from the MPO's member agencies, the public transportation provider, North Dakota Department of Transportation, Federal Highway Administration, and a representative of the region's freight industry.
Policy Board	Serves as the decision-making body of the MPO and comprises the mayors of Bismarck, Mandan, and Lincoln and one commissioner from both Burleigh and Morton counties.

Figure 1: Bismarck-Mandan MPO Area



The Metropolitan Transportation Planning Process

Federal regulations related to metropolitan transportation planning require MPOs to develop four key documents (listed below) to ensure transportation planning in the region is performance based, multimodal, continuous, cooperative, and comprehensive.

Metropolitan Transportation Plan (MTP)	Guides the development of the area's transportation system over the next 20+ years. The MTP is required to be updated every 5 years for the MPO to maintain eligibility for federal transportation dollars; MPOs that are designated as air quality non-attainment areas are required to update the MTP every 4 years. The MTP addresses transportation system needs and provides a set of methods, strategies, and actions for developing an integrated multimodal system that supports the efficient movement of people and goods, including pedestrians, bicyclists, automobile drivers, transit users, and freight shippers.
Transportation Improvement Program (TIP)	Identifies regionally significant and federally funded transportation improvements in the Metropolitan Planning Area (MPA) over a 4-year time frame. Federal regulations require each MPO to develop a TIP for projects using federal transportation funding sources. The TIP is developed on an annual basis in cooperation with MPO area member jurisdictions, transit providers, and NDDOT.
Unified Planning Work Program	Describes the multimodal transportation planning projects to be conducted in the Bismarck-Mandan MPO area in any specified 1- or 2-year period. This document is the foundation for requesting federal funds and a control tool for scheduling, budgeting, and monitoring the transportation planning process.
Public Participation Plan	Identifies the role of the MPO regarding public participation and provides guidelines to be followed in achieving public involvement through advertising, public meetings, hearings, and other relevant forums.

The Metropolitan Transportation Plan

The MTP is the MPO's road map for navigating the region's future multimodal transportation system. The plan reflects local conditions and assesses the performance of the Bismarck-Mandan region's transportation system while meeting the metropolitan transportation planning requirements of the Bipartisan Infrastructure Law. Under these requirements, the MTP:

- Must be updated every 5 years;
- Must be fiscally constrained;
- Utilizes a planning horizon of at least 20 years;
- Consults local agencies, NDDOT, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA);
- Is a performance-based plan that guides progress toward regional performance measures and targets while supporting state performance targets.

Arrive 2050 builds off the 2045 MTP to continue transportation planning in the Bismarck-Mandan region while incorporating the findings and recommendations of plans and studies that have been completed since the publication of the 2045 MTP. The plan was developed in accordance with Bismarck-Mandan MPO's Public Participation Plan to ensure proactive public involvement throughout the MTP development process. Consultation with staff of the MPO's member jurisdictions was ongoing and included the following agencies:

- **City of Bismarck**
- **City of Mandan**
- **City of Lincoln**
- **Burleigh County**
- **Morton County**
- **Bis-Man Transit**

In addition to these jurisdictional partners, consultation included the FHWA, FTA, and NDDOT and was ongoing through the process to maintain adherence to federal and state metropolitan transportation planning requirements.

Goals, Objectives, and Performance Measures

Federal and State Metropolitan Transportation Planning

The Bipartisan Infrastructure Law, enacted as the Infrastructure Investment and Jobs Act (IIJA) in November 2021, is the current legislation governing metropolitan transportation planning. The Law continues the Metropolitan Planning Program authorized under the Moving Ahead for Progress in the 21st Century Act (MAP-21), which established a performance-based planning framework for making transportation investment decisions in metropolitan areas. Key elements of the Metropolitan Planning Program reflected in Arrive 2050 are the alignment of plan goals and objectives with the current metropolitan transportation planning factors and planning emphasis areas.

Metropolitan Transportation Planning Factors

The goals and objectives of Arrive 2050 were developed based on community and stakeholder input and alignment with the metropolitan planning factors articulated in 23 Code of Federal Regulations (CFR) § 450.306, which are presented in **Table 1**. The purpose of the metropolitan planning factors is to supplement efforts made by MPO to engage in a metropolitan planning process that is continuous, cooperating, and comprehensive while addressing national, state, and local transportation priorities.

Planning Emphasis Areas

Planning emphasis areas (PEAs) are topics identified jointly between FHWA and FTA that address current nationwide transportation issues. FHWA and FTA encourage state transportation agencies and MPOs to emphasize the PEAs in their Unified Planning Work Programs and Statewide Planning and Research Programs. The first series of PEAs were identified by FHWA and FTA in 2014, while the current PEAs were identified in 2021; the current PEAs are summarized in **Table 2**.

Table 1: Federal Metropolitan Transportation Planning Factors

	Federal Metropolitan Transportation Planning Factors
1	Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2	Increase the safety of the transportation system for motorized and non-motorized users.
3	Increase the security of the transportation system for motorized and non-motorized users.
4	Increase accessibility and mobility of people and freight.
5	Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency among transportation improvements and state and local planned growth and economic development patterns.
6	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7	Promote efficient system management and operation.
8	Emphasize the preservation of the existing transportation system.
9	Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
10	Enhance travel and tourism.

Source: Federal Highway Administration, *23 CFR § 450.306(b)*

Table 2: Planning Emphasis Areas

Planning Emphasis Area	Description
Tackling the Climate Crisis - Transition to a Clean Energy and Resilient Future	Ensure that transportation plans and infrastructure investments help achieve the national greenhouse gas reduction goals of 50–52 percent below 2005 levels by 2030 and net-zero emissions by 2050 and increase resilience to extreme weather events and other disasters resulting from the increasing effects of climate change.
Equity and Justice40 in Transportation Planning	Advance racial equity and support for underserved and disadvantaged communities.
Complete Streets	Review current policies, rules, and procedures to determine their impact on safety for all road users. This effort should work to include provisions for safety in future transportation infrastructure, particularly those outside automobiles.
Public Involvement	Increase meaningful public involvement in transportation planning by integrating Virtual Public Involvement tools into the overall public involvement approach while ensuring continued public participation by individuals without access to computers and mobile devices.
Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination	Coordinate with representatives from DOD in the transportation planning and project programming process on infrastructure and connectivity needs for STRAHNET routes and other public roads that connect to DOD facilities.
Federal Land Management Agency Coordination	Coordinate with federal land management agencies in the transportation planning and project programming process on infrastructure and connectivity needs related to access routes and other public roads and transportation services that connect to federal lands.
Planning and Environmental Linkages	Implement planning and environmental linkages as part of the transportation planning and environmental review processes.
Data in Transportation Planning	Incorporate data sharing and consideration into the transportation planning process because data assets have value across multiple programs.

Source: U.S. Department of Transportation, *2021 Planning Emphasis Areas*

North Dakota's Long-Range Transportation Plan Vision and Goals

Arrive 2050 works to support the transportation vision of the state of North Dakota. North Dakota's current long-range transportation plan, *Transportation Connection*, was adopted in 2021 and articulates the state's vision:

*Delivering a **safe**, **innovative**, and **connected** future*

A series of goals and objectives were developed by NDDOT as part of *Transportation Connection* to guide the state toward realizing this vision, including:

- **Keeping you safe:** Safety is reflected in everything we do.
- **Caring for what we have:** Fixing what we have is our priority.
- **Connecting North Dakota:** Transportation matters.
- **Helping you get there:** Transportation should be easy.
- **Investing in the future:** We work for you.

Arrive 2050 Goals and Objectives

The study team developed the goals and objectives based on input and engagement received during the initial stages of plan development and locally tailored consistency with federal and state goals and planning directives. Current direction from FHWA encourages MPOs to emphasizes the following performance goal areas in their MTPs.

- **Safety and security**
- **Infrastructure condition (for bridges and pavement)**;
- **Congestion reduction**
- **System reliability for freight movement and economic vitality**
- **Alternative transportation modes to automobile travel**
- **Environmental sustainability**
- **Reduced project delivery**

The goals areas and objectives guiding Arrive 2050 are summarized on the following pages.

Arrive 2050 Goals and Objectives

Safety

Reducing the risk of traffic crashes and harm to all users of the transportation system regardless of travel mode.

Objective 1

Reduce Crash Frequency and Severity: Based on crash history and future crash prediction, work to reduce the incidence of all motor vehicle and non-motor vehicle (pedestrian and cyclist) crashes, with an emphasis on serious injury and fatal crashes. Consider the context of each transportation corridor and safety needs by existing and potential modes of travel using the corridor.

Objective 2

Implement Safe System Features: Implement improvements that align with FHWA Safe Systems Approach and are proven crash reduction measures at locations with an existing crash history. Also implement proven crash reduction measures at locations without an existing crash history as a proactive improvement.

Objective 3

Vision Zero: Support North Dakota's Strategic Highway Safety Plan "Vision Zero" as a goal to move toward zero fatal resultant crashes.

Economic

Promoting the economic vitality of the MPO area by working to ensure transportation facilities fit with and support their surrounding community context and long-term community goals.

Objective 1

Safe and Reliable Freight Movement: Enhance the safe, efficient, and reliable movement of freight and goods, including investments in congestion reduction and safety improvements on critical urban freight corridors and other designated freight corridors.

Objective 2

Support Other Regional Plans:

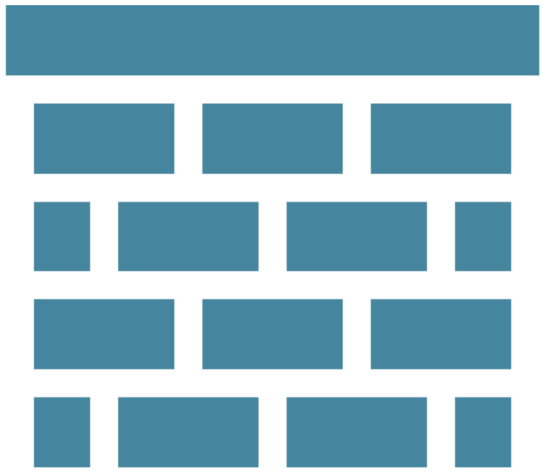
a. Support transportation investments as identified in the most recent MPO Regional Freight Study.
b. Promote transportation design and investments that enhance the local economy as promoted in local community planning documents.
c. Support the efforts of local jurisdictions' land use planning, ensuring that new land use plans are well coordinated with the MTP and other MPO transportation planning efforts.

Objective 3

Support Efficient Development Patterns: Promote transportation investments that support infill/efficient development patterns.

Resilient

Providing a transportation system that is secure from man-made disaster and adaptable to severe weather, major economic changes, and other shocks. Impacts on the built and natural environment are avoided, minimized, and mitigated to the greatest extent possible.



Objective 1

Minimize Environmental Impacts: Strive to avoid and minimize the transportation system's impacts on the natural and built environment. Identify multimodal transportation system impacts through planning and, as necessary, mitigate impacts to the greatest extent feasible.

Objective 2

Integrate Multimodal Design into New Development: Plan for and address multimodal transportation system impacts/ sufficiency when planning new developments.

Objective 3

System Security: Enhance transportation security and resiliency by developing strategies to address critical transportation assets that will facilitate the rapid movement of first responders and support incident management during times of emergency.

Objective 4

Reduce and/or Mitigate Vehicle Miles Traveled (VMT): Implement strategies and projects that reduce the rate of VMT growth to lessen transportation emissions and the associated environmental and air quality impacts. Implementing strategies that reduce VMT growth have broad benefits, such as the opportunity for shorter trips, more transportation connections, reduced transportation costs, and using modes other than automobile travel.

Efficiency and Reliability

Providing for the efficient, reliable movement of people along with connecting people and where they live to goods, services, and jobs with multiple options and a focus on predictable travel times. This goal also places an emphasis on improving the efficiency in how transportation projects are delivered.

Objective 1

Promote Reliable Vehicle Travel: Implement strategies and projects that increase transportation system reliability by reducing unexpected or non-recurring incidents and bottlenecks to make travel time more predictable.

Objective 2

Improve Management of Corridor Access Points: As part of transportation corridor reconstruction projects and the establishment of new corridors, carefully limit roadway access points to further safety and mobility needs.

Objective 3

Reduce Single-Occupant Vehicle Travel: Support future development that would result in reduced motor vehicle trips/increased use of travel options other than single-occupant vehicles.

Objective 4

Promote the Efficient Delivery of All Transportation Projects: Identify additional ways to complete all transportation construction projects more quickly, saving time and money.

Objective 5

Promote the Efficient Delivery of Complementary Multimodal Improvements with Roadway Construction Projects: Construct active transportation and transit improvements with complementary roadway projects to promote the efficient delivery of construction projects.

Maintenance

Maintaining transportation assets, including roadway pavement and bridges, active transportation facilities, and transit capital, in a state of good repair.

Objective 1

Pavement and Bridge Condition: Maintain pavement quality and bridges at acceptable levels.

Objective 2

Signage and Pavement Marking Condition: Maintain street signage and pavement marking to preserve visibility.

Objective 3

Bicycle and Pedestrian System Condition: Maintain the current bicycle and pedestrian system.

Objective 4

Transit Capital Condition: Maintain transit fleet, equipment, and facilities in a state of good repair as identified in the Transit Development Plan.

Objective 5

Signal, Lighting, and Intelligent Transportation Systems (ITS) Conditions: Maintain traffic signals, lighting, and other transportation ITS assets at acceptable levels.

Objective 6

Proactively Manage Pavement: All MPO participating jurisdictions should cost-participate in the data collection of pavement system conditions on a 4-/5-year cycle.

Forward-Thinking

Incorporating emerging trends and technologies into the transportation system. This includes deploying innovative infrastructure (such as for electric vehicles [EVs] or autonomous travel), using innovative mobility options, and utilizing innovative data sources to make more informed decisions.

Objective 1

ITS Maintenance and Planning: Maintain and enhance ITS already in use locally and their evolution, such as dynamic signal phasing, driver information systems, and vehicle detection systems.

Objective 2

Manage the System Through Technology: Consider the application of ITS to help mitigate the need for capital-intensive projects and associated impacts.

Objective 3

Plan for Connected and Autonomous Vehicles: Champion further testing and integrating autonomous and connected vehicles in the transportation system. Coordinate with NDDOT on statewide planning, the State Transportation Management Center development, and other opportunities related to connected and autonomous vehicles to best position the MPO area for the future.

Objective 4

Plan for Electric Vehicles: Accommodate EV market trends through planning efforts and development opportunities, such as promoting the expansion of charging stations. Continue to coordinate with NDDOT on statewide planning and other opportunities related to EVs to best position the MPO area for the future.

Objective 5

Leverage Data for Decision-Making: Apply well-vetted and appropriate datasets available to help support more intelligent local decision-making regarding transportation planning, design, and investments.

Active Transportation and Transit

Providing enhanced infrastructure and connections for pedestrians, bicyclists, and other modes of active transportation; transit is integral to transportation in the MPO area and compliments both active transportation and passenger auto transportation.

Objective 1

Transit Coordination: Coordinate planning and project development with transit agencies to improve transit route efficiency, safety, system productivity, and community awareness by implementing transportation investments that support the transit system.

Objective 2

Implement Transit and Rideshare Strategies: Improve transit and rideshare opportunities for travelers commuting into the MPO area from both outside and within the urban area.

Objective 3

Transit Security: Provide a safe, secure environment for transit system riders.

Objective 4

Bicycle and Pedestrian Project Implementation: Improve bicycle and pedestrian system accessibility, connectivity, and safety by promoting or implementing transportation investments identified in recent MPO planning documents.

Active Transportation and Transit (continued)

Objective 5

User Education: Improve the awareness and safety for all users of the regional multimodal transportation system through education about rules and responsibilities.

Objective 6

Reduce Multimodal Gaps: Improve the continuity of the multimodal systems for pedestrians, cyclists, and transit riders through improved network connections, reduced circuity, and reduced system gaps.

Objective 7

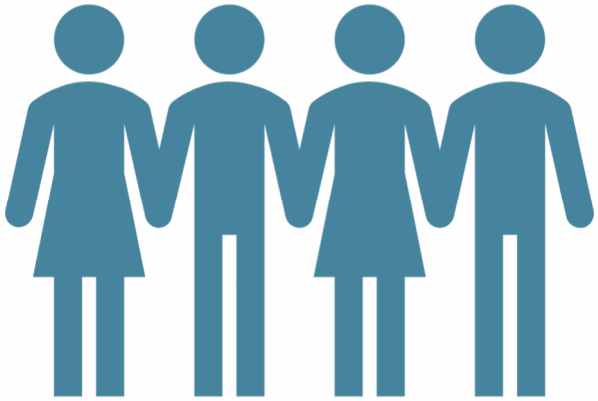
Multimodal Coordination: Improve the coordination between planning for active transportation and transit to ensure transit stops/timing points are safe and well connected to the active transportation system; improve first-mile/last-mile connectivity.

Objective 8

Implement Complete Streets: Implement transportation projects that accommodate active transportation and transit where feasible. Overall, streets in the MPO area will become more accommodating for active transportation and transit.

Equity

Improving transportation infrastructure so that people from all walks of life have access to affordable, reliable transportation options, including consideration of how transportation benefits and impacts all members of the community.



Objective 1

Connect Disadvantaged Neighborhoods: Plan projects and programs that safely connect disadvantaged populations to the surrounding transportation system, with a focus on all modes of transportation. Also provide projects in or adjacent to disadvantaged populations that respond to each community's desired multimodal mobility and accessibility and safely connect disadvantaged populations to needed services.

Objective 2

Proactive Community Engagement: Implement early community engagement in the transportation project development process that includes as many impacted and potentially impacted populations as possible. As applicable, focus engagement on the neighborhood level, consistent with the MPO's Public Participation Plan.

Objective 3

Minimize Impacts on Disadvantaged Populations: Balance impacts and burdens stemming from multimodal transportation improvements among populations in the MPO region.

Arrive 2050 Performance Measures and Targets

Federal regulations related to metropolitan transportation planning require the application of a performance-based planning approach that leverages data to inform decision-making and transportation outcomes. MAP-21 established a series of national performance measures and targets that state transportation agencies and MPOs are required to monitor progress toward; these performance measures and targets were carried forward in subsequent transportation legislation, including Fixing America's Surface Transportation Act and IIJA.

National Performance Measures and Targets

The series of performance measures and targets that state transportation agencies and MPOs are required to track progress toward cover several performance goal areas, including the following:

- **Safety and security**
- **Infrastructure condition** (for bridges and pavement)
- **System reliability**

State transportation agencies are required to identify performance targets for the topics outlined above while MPOs have the option to adopt statewide targets or develop their own locally tailored targets. State transportation agencies and MPOs strive to maintain progress toward these performance targets because failure to meet them can result in less discretion with how they can spend funds due to additional programming oversight by FHWA.

Federal rulemaking has specified performance measures for three of the seven performance goal areas, which are Safety and Security (PM1), Infrastructure Condition (PM2), and System Reliability (PM3).

PM1: Safety and Security

Performance targets associated with Safety and Security are updated and reported to FHWA annually and are calculated using a 5-year rolling average. The individual performance measures targeted by NDDOT and the Bismarck-Mandan MPO are shown in **Table 3** and include the number and rate of fatal injuries, number and rate of serious injuries, and number of non-motorized fatal and non-motorized serious injuries. As **Table 3** shows, the MPO has adopted the same 2024 targets set by NDDOT.

PM2: Infrastructure Condition

Performance targets associated with Infrastructure Condition are updated at least every 4 years, with the option for state transportation agencies and MPOs to update every 2 years. Federal rulemaking requires that individual targets are reported to FHWA annually. The individual performance measures targeted by NDDOT and the Bismarck-Mandan MPO are shown in **Table 4** and include the percentage of National Highway System (NHS) bridges in good and poor condition, percentage of interstate pavement in good and poor condition, and percentage of non-interstate NHS pavement in good and poor condition. As **Table 4** shows, the MPO has adopted the same 2022–2026 targets set by NDDOT.

PM3: System Performance and Reliability

Performance targets associated with System Performance are updated every 4 years and reported to FHWA annually. The individual performance measures targeted by NDDOT and the MPO are shown in **Table 5** and include the percentage of person-miles traveled on the interstate and non-interstate NHS and truck travel time reliability. As **Table 5** shows, the MPO has adopted the same 2024 targets set by NDDOT.

Table 3: PM1 (Safety and Security) Adopted Performance Targets

PM1: Safety and Security	Baseline Condition	NDDOT Adopted Target	MPO Adopted Target	Current Adoption Period
1. Number of Fatalities	100.8	95.8	95.8	2024
2. Rate of Fatalities	1.074	1.053	1.053	2024
3. Number of Serious Injuries	406.2	398.1	398.1	2024
4. Rate of Serious Injuries	4.336	4.25	4.25	2024
5. Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	35.2	34.5	34.5	2024

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Table 4: PM2 (Infrastructure Condition) Adopted Performance Targets

PM2: Infrastructure Condition	Baseline Condition	NDDOT Adopted Target	MPO Adopted Target	Current Adoption Period
1. Percent of NHS Bridges in Good Condition	65.3%	50%	50%	2022–2026
2. Percent of NHS Bridges in Poor Condition	3.8%	10%	10%	2022–2026
3. Percentage of Interstate Pavement in Good Condition	83.6%	75.6%	75.6%	2022–2026
4. Percentage of Interstate Pavement in Poor Condition	0.1%	3%	3%	2022–2026
5. Percentage of Non-Interstate NHS Pavement in Good Condition	78.5%	58.3%	58.3%	2022–2026
6. Percentage of Non-Interstate NHS Pavement in Poor Condition	3.4%	3%	3%	2022–2026

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Table 5: PM3 (System Reliability) Adopted Performance Targets

PM3: System Reliability	Baseline Condition	NDDOT Adopted Target	MPO Adopted Target	Current Adoption Period
1. Percentage of Person-Miles Traveled on the Interstate that are Reliable	99.4%	85%	85%	2022–2026
2, Percentage of Person-Miles Traveled on the Non-Interstate NHS that are Reliable	91%	85%	85%	2022–2026
3. Truck Travel Time Reliability	1.15	2.0	2.0	2022–2026

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Additional performance measures reported by the Bismarck-Mandan MPO concern public transit and look toward monitoring safety and transit asset management.

Transit Safety

FTA rulemaking related to public transit agency safety required the adoption of a Public Transportation Agency Safety Plan by December 31, 2020. As part of this rulemaking, public transit agencies are required to create transit operator's safety performance measures, which address transit-related fatalities, injuries, safety vents, and system reliability. **Table 6** presents the current transit safety performance measures for the MPO region.

Transit Asset Management

Transit asset performance is reported by the region's public transit agency, Bis-Man Transit, annually and monitors the condition of transit facilities and vehicles, as well as anticipated revenues expended on maintenance of the current transit fleet and capital assets. This information is published as part of the annual Transit Asset Management report that is included in the MPO's annual TIP. **Table 7** through **Table 9** provides the transit asset performance measure targets as published in the 2025 Transit Asset Management report.

Table 6: Transit Safety Performance Measures

Mode of Transit Service	Fatalities (Total)	Fatalities (per 100 thousand Vehicle Revenue Miles [VRM])	Injuries (Total)	Injuries (per 100 thousand VRM)	Safety Events (Total)	Safety Events (per 100 thousand VRM)	System Reliability (VRM/Failures)
Fixed Route Bus	0	0	3 or less	0.2	5 or less	0.33	9,500
Americans with Disabilities/ Paratransit	0	0	3 or less	0.75	1 or less	0.1	35,000

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Table 7: Useful Life Benchmark for Vehicles

Category	Length (in feet)	Seats	FTA Useful Life (UL) Years	FTA UL Miles	FTA Useful Life Benchmark (ULB) Years	NDDOT ULB Years	Bismarck-Mandan Transit ULB Years
Heavy Duty Large Bus	35 to 40+ ft	24 to 40+	12	500,000	14	14	14
Heavy Duty Small Bus	30 to 35 ft	24 to 35	10	350,000	14	14	14
Medium Size Cutaway	25 to 30 ft	16 to 30	7	200,000	10	10	10
Light Duty Mid-Sized Cutaway	20 to 25 ft	8 to 16	5	150,000	10	10	10
Light Duty Small Cutaway	16 to 22 ft	3 to 14	4	100,000	10	10	10
Modified Van	20 to 22 ft	3 to 14	4	100,000	8	8	8
Minivan	up to 12 ft	3 to 12	4	100,000	8	8	8
Automobile		3 to 7	4	100,000	8	8	8

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Table 8: Useful Life Benchmark for Transit Facilities

Category	Usage	ULB Years
Bus Garage	Bus Storage, Wash	40
Garage Operations Facility	Storage, Wash, Dispatch, Training, Light Maintenance	40
Garage Operations Admin	Administrative Offices, Storage, Wash, Dispatch	40
Shelters	Seating	20

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Table 9: Transit Asset Management Performance Targets

Agency Name	Asset Category	Asset Class	2022 Target	2023 Target	2024 Target	2025 Target	2026 Target	2027 Target
NDDOT	Equipment	Non-Revenue/Service Automobile	29%	40%	40%	37%	35%	29%
NDDOT	Equipment	Other Rubber Tire Vehicles	60%	40%	40%	37%	35%	29%
NDDOT	Facilities	Administrative/Maintenance Facilities	0%	0%	0%	0%	0%	0%
NDDOT	Facilities	Passenger Vehicles	0%	0%	0%	0%	0%	0%
NDDOT	Revenue Vehicles	BU - BUS	29%	28%	15%	14%	15%	15%
NDDOT	Revenue Vehicles	CU - Cutaway	15%	25%	25%	24%	28%	20%
NDDOT	Revenue Vehicles	MV - Minivan	11%	20%	25%	28%	25%	24%
NDDOT	Revenue Vehicles	SV - Sports Utility Vehicle	50%	50%	40%	37%	35%	40%
NDDOT	Revenue Vehicles	VN - Van	36%	35%	42%	40%	35%	24%

Source: Bismarck-Mandan MPO, *FY2025–2028 Transportation Improvement Program*

Project Alignment with Regional Vision

Projects that were identified through Arrive 2050 were individually evaluated for how well they align with the goals and vision for the Bismarck-Mandan region. Each project was compared against a scoring criterion for each Arrive 2050 objective and then awarded full points for that objective if they met the criteria. Projects were not awarded points for a scoring criterion if the objective was not met.

Scoring systems like this are not perfect representations of "the best" projects because they can leave out some critical projects that address one or two important criteria (like safety issues or maintenance needs). This approach does reflect how many different goal areas certain projects touch. Thus, project scores were totaled, and the top-scoring projects were in the "High" category, with the next tier put in the "Medium" category, and the final tier put in the "Low" category. Projects categorized as "Medium" or "Low" are not disregarded because they may still serve the region well but scored lower for not aligning with Arrive 2050 objectives.

Some objectives are more important to advance each goal area than others and were awarded a higher number of possible points. A table describing each objective and total possible points can be found in **Appendix A**.

Appendix A provides a summary report card for each project and in which goal area objectives that project scored.

Public Engagement

Public engagement is a key driver of Arrive 2050 and was ongoing throughout the plan's development. Public engagement is critical to the transportation planning process. Public engagement activities held as a part of Arrive 2050 include website, public open houses, stakeholder meetings, and online engagement opportunities to gain meaningful feedback on the plan's progress. Recurring meetings with the Arrive 2050 Steering Committee, progress updates for the TAC and Policy Board, and a final plan presentation to the NDDOT Management Committee were also held. Additional detail about public engagement events hosted as part of the development of Arrive 2050 is available in **Appendix B**.

Project Website

A project website was developed to house information on Arrive 2050's development, advertise engagement events, and provide a general overview of the plan. This site hosted the online meetings held during the development of Arrive 2050.

Public Open Houses

A series of public open houses were held at various milestones during the development of Arrive 2050. Each meeting was advertised on many different platforms, including in the Bismark Tribune, in the Mandan News, through press releases, and social media posts on the MPO's Facebook page.

Public Open House 1: November 9, 2023

The initial round of public engagement for the Arrive 2050 plan was started with two in-person events. One was located at the Missouri Valley Family YMCA in Bismarck from 11:30 a.m. to 1:30 p.m., and the second open house was located at The Innovation Barn in Mandan from 4 p.m. to 6 p.m. The purpose of these meetings was to gather public feedback on the Arrive 2050 goal areas and to begin to develop geographic-specific issue areas.

The plan input included:

- **Arrive 2050 Goals Priorities:** For the 10 goal areas, participants received 5 dot stickers to indicate which areas they considered the most important.
- **Arrive 2050 Issues Mapping:** Participants were provided maps of the area to write ideas for geographic-specific issue areas.

Between the two events, 40 community members attended, with more attendees at the Bismarck event. In Public Open House 1, the top three priorities according to the attendees were safety, active transportation, and efficiency and reliability.

Attendees at Public Open House #1

Public Open House 2: May 29, 2024

The second round of public engagement for the Arrive 2050 plan included an in-person public open house at the Missouri Valley Family YMCA in Bismarck from 11:30 a.m. to 1:30 p.m. The purpose of this open house was to gather input from community members on potential future transportation strategies and projects. The informational boards for the public open house included:

- **Welcome Sign**
- **Open House #1 Recap**
- **Strategies (6 total)**
- **Next Steps**

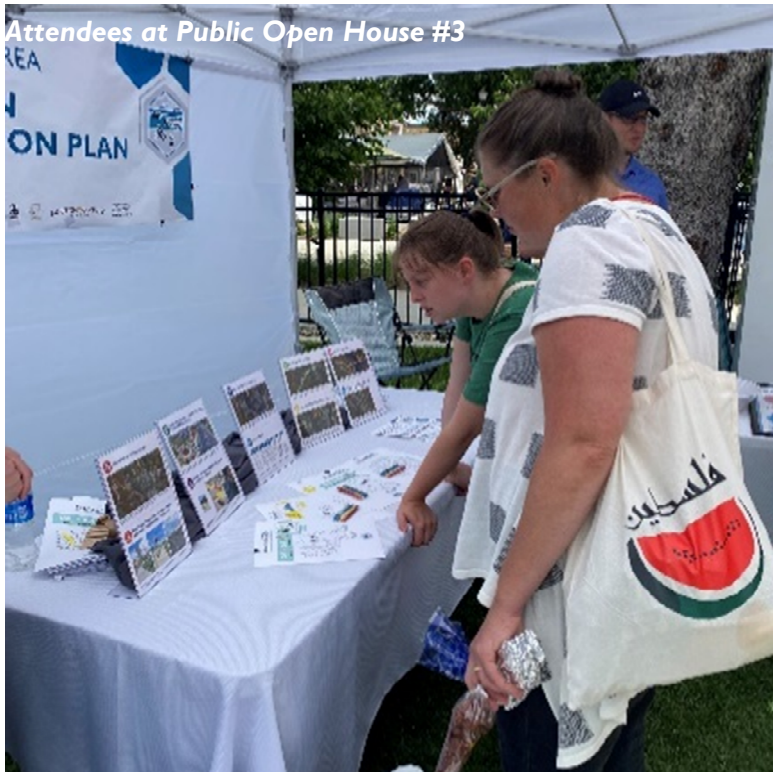
In addition to the meeting boards, there was a TV screen playing a presentation of technical information, including the following:

- **Baseline System Conditions**
    - Delays Maps
    - Planning Level of Service
    - Travel Time Reliability
    - System Reliability
    - Crash Data, Locations, and Frequency
    - Freight Summary
    - Bicycle and Pedestrian System
    - Transit System
    - Pavement and Bridge Conditions
- **Future Growth**
    - Household and Employment Growth
    - Traffic Volumes

There was a plan input station for the participants to place a dot sticker on which of the six strategies they preferred. The open house had approximately 30 people in attendance.

Public Open House 3: July 3, 2024

The third public open house was held at the Mandan's annual Art in the Park Festival; the booth was staffed from 10 a.m. to 5 p.m. The purpose of this engagement was to update attendees on the plan's progress and allow participants to provide input on prioritizing projects and strategies. This open house event had approximately 30 attendees. At the open house attendees could voice their preference by placing popsicle sticks into jars. This method allowed participants to express their preferences for which areas they think should be prioritized.



Attendees at Public Open House #3

Attendees at Public Open House 3 identified a Northern Bridge Crossing as a priority transportation improvement for the region. The full results of the voting activity are:

- **Northern Bridge Crossing:** 22 votes
- **More Funding for Public Transit:** 20 votes
- **I-94 – 56th Avenue/66th Street:** 18 votes
- **More Bike Paths:** 15 votes
- **Fill in the Street Grid Networks:** 13 votes
- **I-94 – 52nd Avenue/Hamilton/30th Street:** 12 votes
- **System Management:** 11 votes
- **McKenzie Road Extension:** 8 votes
- **66th Street/State Street Improvements at 71st Street:** 8 votes
- **More Pedestrian Crossings:** 7 votes

Online Engagement Events

Three online engagement meetings were held to solicit further public input on the goals, strategies, and draft plan. These meetings reviewed the public involvement process and previous events, updated attendees on the plan's progress, and provided an opportunity for participants to offer their recommendations.

Stakeholder Groups

Two stakeholder group meetings were held to inform stakeholders about the MTP development process and to gather additional feedback beyond what was collected at the public open houses. Information was presented about the baseline conditions in Bismarck-Mandan and included a feedback survey on plan goals. Stakeholders represented the following organizations:

- **City of Bismarck**
- **City of Mandan**
- **Downtowners**
- **Bismarck Mandan Chamber EDC**
- **CHI St. Alexius Health**
- **Developers**

Steering Committee

The plan was developed in strong coordination with MPO's jurisdictional partners. Arrive 2050's advisory role was filled by a steering committee made up of planners and engineers representing each MPO jurisdictional partner and NDDOT representatives. The steering committee met 5 times during development of the travel demand model and 10 times during development of the Arrive 2050 plan document. The steering committee provided input on plan direction and the perspective of each jurisdiction and organization as the plan came together.

MPO TAC and Policy Board

Monthly plan progress updates were provided to TAC and the Policy Board. These meetings were open to the public.

NDDOT Management Committee

The Arrive 2050 team presented to the NDDOT Management Committee on October 25, 2024. After a presentation and some questions and answers, a few minor clarifications and edits were carried over into the Final draft of this document.

The Bismarck-Mandan MPO Area Today

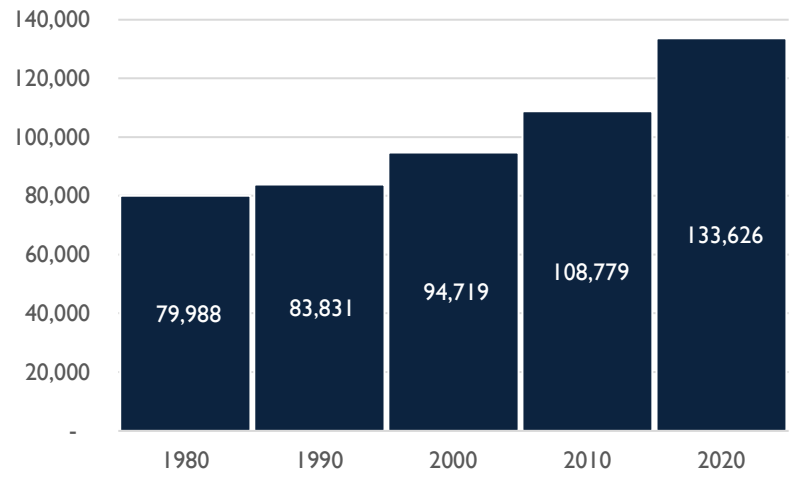
To better understand the MPO region's residents and workers, a review of current demographic and employment data was conducted. Through developing a demographic and employment profile of the community, the Bismarck-Mandan MPO can better understand the current transportation needs of residents and workers. The demographic and employment data reviewed as part of this community profile was for the Bismarck-Mandan metropolitan statistical area.

Historic Population Growth

Historic population levels for the Bismarck-Mandan metropolitan area were obtained from past U.S. decennial censuses to illustrate how the region has grown since 1980. **Figure 2** presents these historic population levels and illustrates that the metro's population grew modestly between 1980 and 1990. By the year 2000, the population had grown by over 10,000 and growth continued to accelerate over the next 2 decades with the 2020 census recording a population of 133,626.

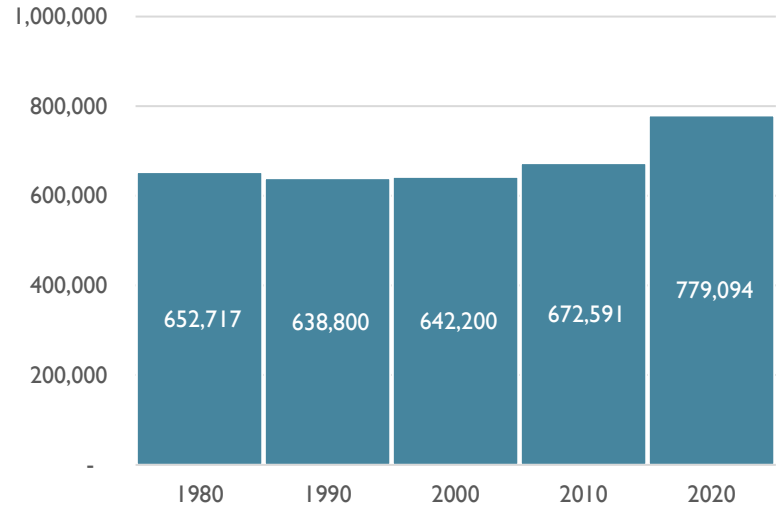
To provide a comparison of how the Bismarck-Mandan metropolitan area has grown over the past 5 decades, historic population levels for the state of North Dakota were also reviewed and are shown in **Figure 3**. The state's population experienced a decline between 1980 and 1990 before experiencing a slight increase in population by the year 2000. Since 2000, North Dakota's population has grown at a substantial rate, which reflects the trend seen for the Bismarck-Mandan metropolitan area.

Figure 2: Population Growth for the Bismarck-Mandan Metropolitan Area, 1980–2020



Source: U.S. Decennial Census, 1980–2022

Figure 3: Population Growth for the State of North Dakota, 1980–2020



Source: U.S. Decennial Census, 1980–2022

Age

Age is an important factor in determining travel demand because different age groups have varying transportation needs. Data related to median age and proportions of the population aged 65 years or older were reviewed to identify the current trends related to these topics.

Median Age

Table 10 summarizes the current median age of residents in the Bismarck-Mandan metropolitan area and provides a comparison to the median age of residents across the state of North Dakota and the United States based on the American Community Survey (ACS) 1-year estimates for the year 2022.

The current median age for residents of the Bismarck-Mandan metropolitan area is 38.5 years, which is slightly higher than the median age of 36.2 years for the state of North Dakota. Compared to the United States, the median age for both the metro area and the state is lower than that of the nation.

Percent of Population 65 Years of Age and Older

The proportion of the population aged 65 years and older in the Bismarck-Mandan metropolitan area has grown since 2010 as illustrated in **Table 11**. In 2010, 13.5 percent of the metro area's population was 65 or older, and this proportion grew to 16.3 percent in 2020. A similar trend was observed for the state of North Dakota as well as the United States for this same period, which highlights an overall shift toward an older population.

Table 10: Median Age for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and United States, 2022

Median Age	
Bismarck-Mandan Metropolitan Area	38.5
State of North Dakota	36.2
United States	39.0

Source: American Community Survey 1-Year Estimates, 2022

Table 11: Percent of the Population Aged 65 Years or Older for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and United States

Percentage of Population Aged 65 Years or Older	2010	2015	2020
Bismarck-Mandan Metropolitan Area	13.5%	14.6%	16.3%
State of North Dakota	14.6%	14.2%	15.3%
United States	12.8%	14.8%	16.1%

Source: American Community Survey 5-Year Estimates, 2010–2020

Housing

Housing characteristics are an additional demographic indicator that is related to travel demand. The average household size for the Bismarck-Mandan metropolitan area, the state of North Dakota, and the United States were identified based on ACS 1-year estimates for the year 2022 and are shown in **Table 12**. It was found that the average household size for the metro area is 2.38 people for owner-occupied households and 2.07 people for renter-occupied households; the resulting average household size is 2.23 people. Compared to the state of North Dakota, the average household size is slightly larger than the state's average of 2.19 people. Households across the United States are larger on average than those of both the metro area and the state of North Dakota.

Table 12: Average Household Size for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and the United States

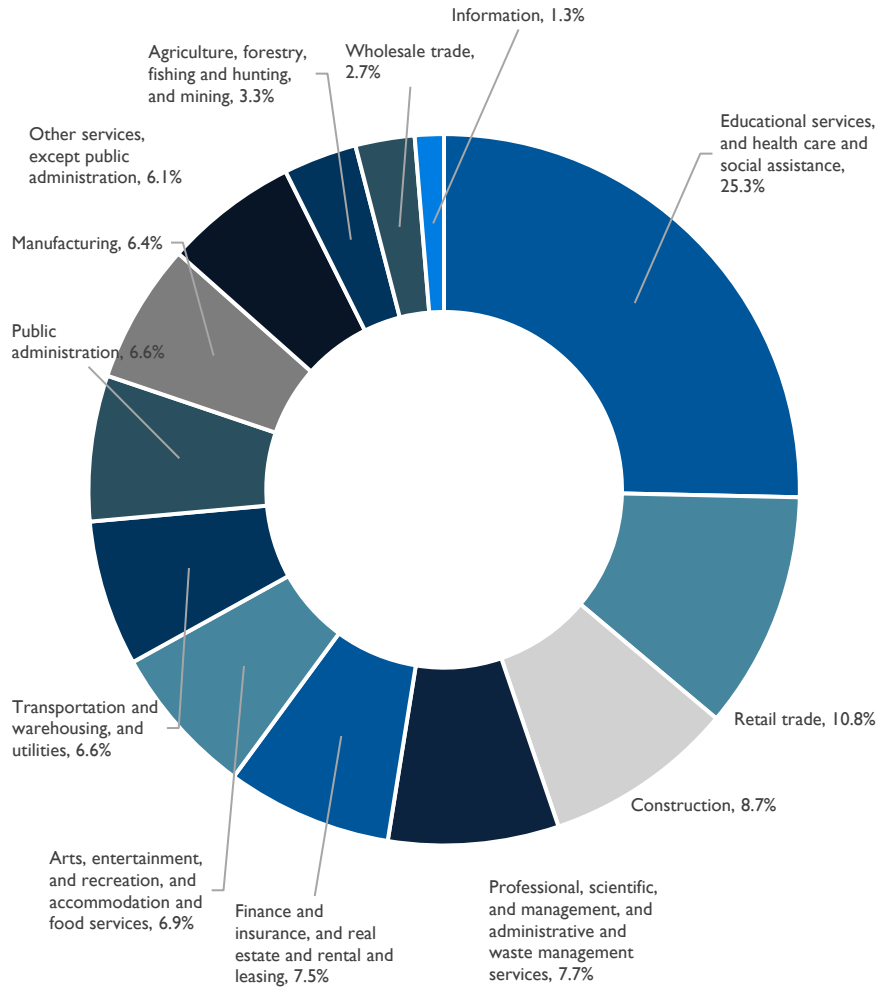
Average Household Size	Owner-Occupied	Renter-Occupied	Average
Bismarck-Mandan Metropolitan Area	2.38	2.07	2.23
State of North Dakota	2.42	1.96	2.19
United States	2.63	2.27	2.45

Source: American Community Survey 1-Year Estimates, 2022

Employment

Data on employment by industry for the Bismarck-Mandan metropolitan area is summarized in **Figure 4**. The largest proportion of workers, at 25.3 percent, in the metro area are employed in educational services, health care, and social assistance. The retail trade employs the second largest proportion of workers at 10.8 percent, while the construction industry employs almost 9 percent of the metro area's workers. Median household income in 2022 was $81,846, which is higher than the national household income of $74,580.

Figure 4: Employment by Industry for the Bismarck-Mandan Metropolitan Area



Source: American Community Survey 1-Year Estimates, 2022

Commuting

Commuting trends for workers in the Bismarck-Mandan metropolitan region were analyzed based on ACS 1-year estimates for the year 2022 so that a profile of means to work, time of departure, and travel time to work could be developed.

Means to Work

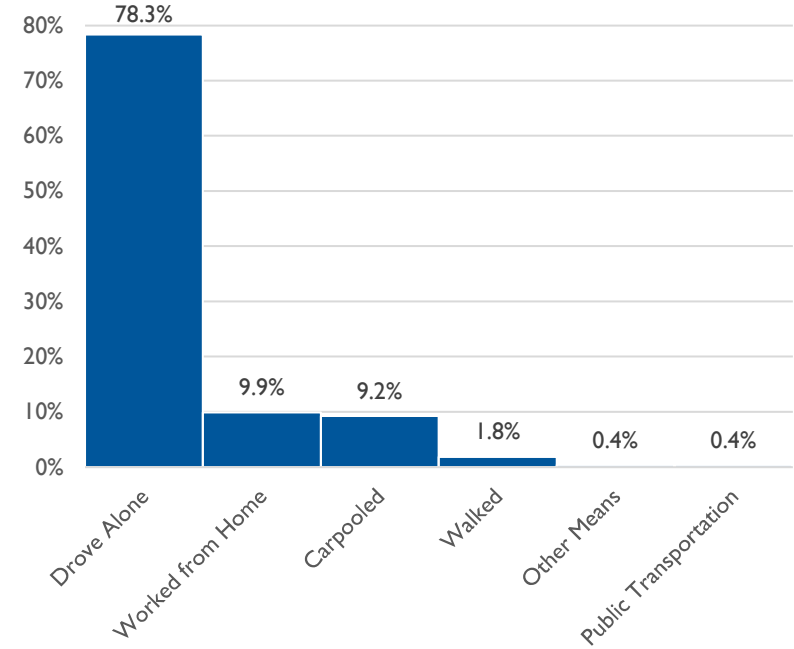
Means to work refers to the primary transportation mode used by workers for commuting purposes. **Figure 5** provides a summary of the current modal share for the metro area's workers.

Approximately 78 percent of workers in the metro area drive alone during their commute, while an additional 9.2 percent carpool; this indicates that more than 87 percent of workers commute to work via automobile each day. Nearly 10 percent of metro area workers are reported as working from home, which marks a significant increase in the proportion of workers who worked from home in 2019, which was reported as 3.2 percent.

This increase marks a trend in working arrangements that began with the COVID-19 pandemic in 2020 that saw a major shift in the number of individuals working from home due to local shelter-in-place ordinances. Since 2020, the number of workers with a work-from-home arrangement has declined when compared to the numbers reported during the pandemic but are still above pre-COVID-19 levels.

Of the remaining commuting modes, roughly 2 percent of metro area workers are estimated to walk to work, while 0.4 percent use public transportation; the remaining 0.4 percent use other means for their commute.

Figure 5: Means of Commuting to Work for the Bismarck-Mandan Metropolitan Area



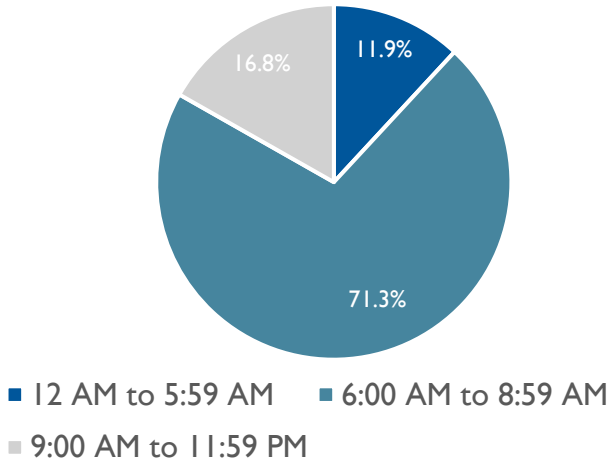
Source: American Community Survey 1-Year Estimates, 2022

Time of Departure

Time of departure refers to the hour in which workers begin their commutes. This measure provides insight into when peak period travel times likely occur as peak travel is typically associated with the morning and afternoon commute period.

Figure 6 illustrates the current breakdown of times of departure for metro area works. As the figure shows, more than 70 percent of the metro area's commuters depart home between the hours of 6 a.m. and 8 a.m. The second largest proportion of commutes begin between the hours of 9 a.m. and 11 p.m. Almost 12 percent of commutes depart between midnight and 5 a.m.

Figure 6: Time of Departure to Work for the Bismarck-Mandan Metropolitan Area



Source: American Community Survey 1-Year Estimates, 2022

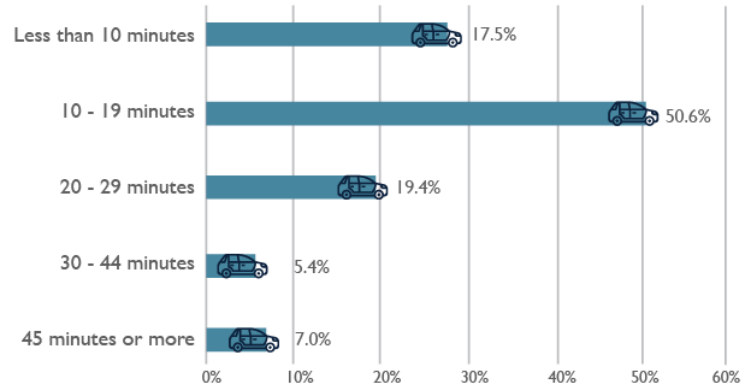
Travel Time to Work

Travel time to work looks at the length of commutes in terms of minutes to provide a picture of how long a worker typically spends commuting to their place of employment. **Figure 7** summarizes the travel times for the metro area's workers.

The largest share of commuters, 26.3 percent, spends between 15 to 19 minutes traveling to work, while 24.3 percent spend between 10 and 14 minutes. The third largest share of workers typically spends less than 10 minutes commuting to work.

Commutes longer than 25 minutes are not common for workers in the Bismarck-Mandan metropolitan area, but it is noted that 5 percent of workers commute 60 or more minutes to their place of employment.

Figure 7: Travel Time to Work for the Bismarck-Mandan Metropolitan Area



Source: American Community Survey 1-Year Estimates, 2022

Commuting Inflow/Outflow

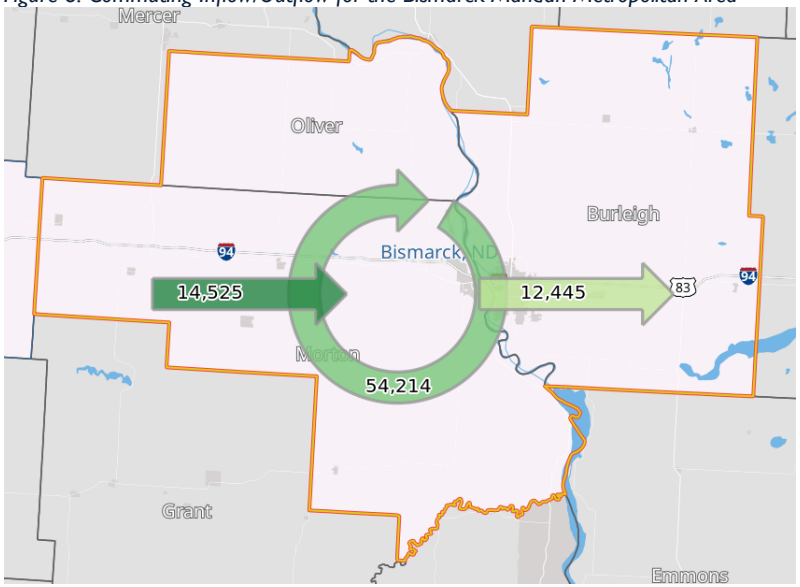
Commuting inflow/outflow is an analysis that looks at commuting flows into, out of, and within a defined area. A commuting inflow/outflow analysis was conducted for the Bismarck-Mandan metropolitan area to identify commuting flow patterns for the region's workers.

The results of the analysis are shown in **Figure 8**. Of the nearly 69,000 workers employed in the Bismarck-Mandan metropolitan area, 54,214 are reported as both living and working in the metro area, while approximately 12,445 individuals employed in the metro area live outside it. The remaining 14,525 of the metro area's workers are reported as living outside the metro but commute into the area for their jobs.

Data related to the top commuting corridors in the MPO area was collected from Replica HQ, a platform that integrates location-based data from mobile devices with land use and ACS demographic data to estimate travel in a geographic area via an activity-based travel demand model. The Replica data was filtered to private automobile trips taken to work locations in the MPO area during a typical weekday in spring 2023.

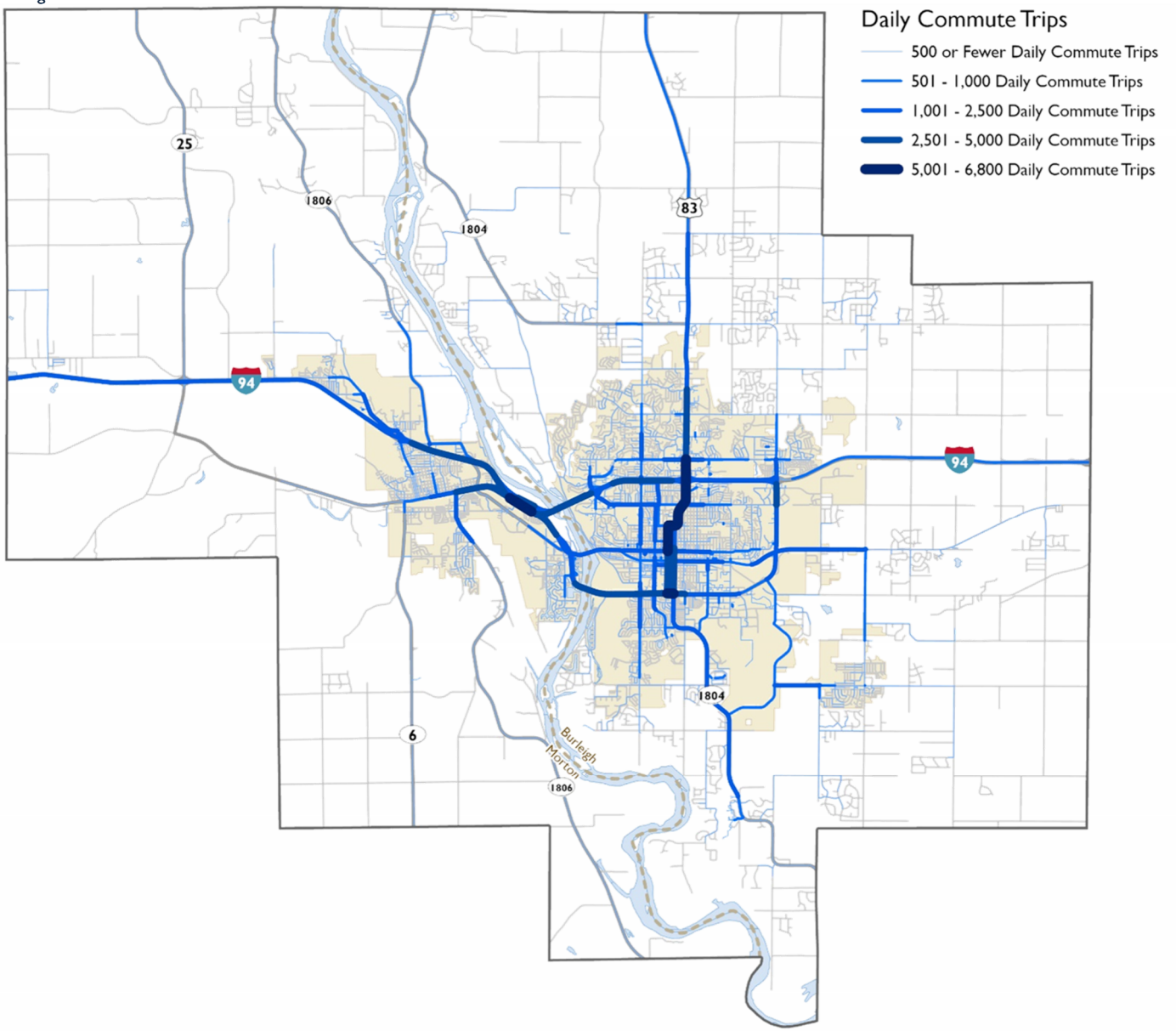
Figure 9 shows the resulting number of commute trips on a typical weekday for the MPO area. As the figure shows, the major corridors used for commuting trips include I-94 in Bismarck and Mandan and U.S. Highway 83 (US 83) in Bismarck. Overall, the MPO's functionally classified system was shown to carry the majority of commute trips because most corridors are estimated to facilitate at least 1,000 commute trips on a typical weekday.

Figure 8: Commuting Inflow/Outflow for the Bismarck-Mandan Metropolitan Area



Source: U.S. Census Bureau, *OnTheMap*

Figure 9: Top Commuting Corridors in the MPO Area



Baseline Transportation System Performance

The baseline conditions of the Bismarck-Mandan MPO's multimodal transportation system were analyzed to identify system issues and needs. Identifying the existing issues and needs of today's multimodal transportation system informs the development of the baseline scenario used to evaluate future multimodal system scenarios. Furthermore, the existing needs and issues guide the development of potential strategies available to MPO to address them. More details on the baseline system performance can be found in **Appendix C**.

This report summarizes the analyses conducted for the multimodal system, including:

Street Network	Safety	Traffic Operations	Freight	Bicycle and Pedestrian	Transit System	Regional Connection	Asset Conditions

MPO Area Street Network

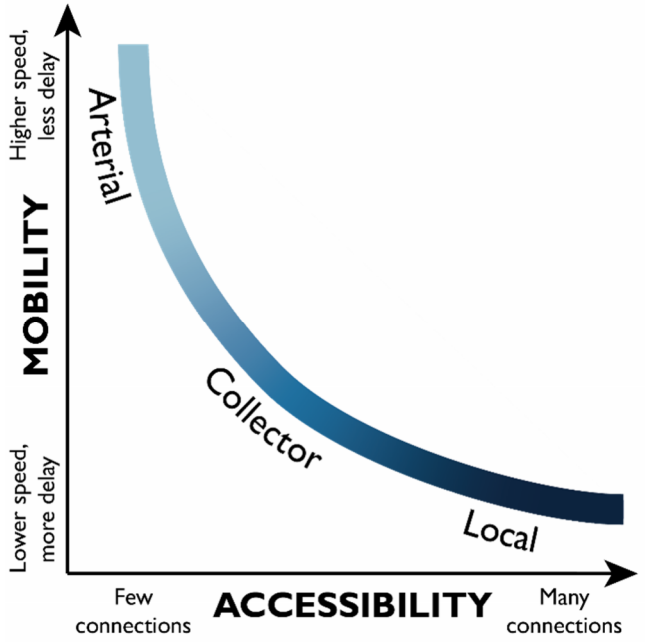
The streets and roadways of the Bismarck-Mandan MPO area are the central feature of the multimodal transportation system. Facilitating mobility and access to regional residential, employment, and recreational destinations, the MPO's streets and highways are a critical element in supporting the region's development and economy.

Functional Classifications

Functional classification is a series of designations used to classify streets and highways based on the character of the service they provide. Functional classification organizes the network to provide a balance between mobility and accessibility to road users, as demonstrated in **Figure 10**. High mobility roadways typically are designed to carry higher daily traffic volumes at higher speeds with limited access, while low mobility roadways are designed to provide higher degrees of accessibility carrying lower daily traffic at lower speeds so that adjacent land uses can be easily accessed.

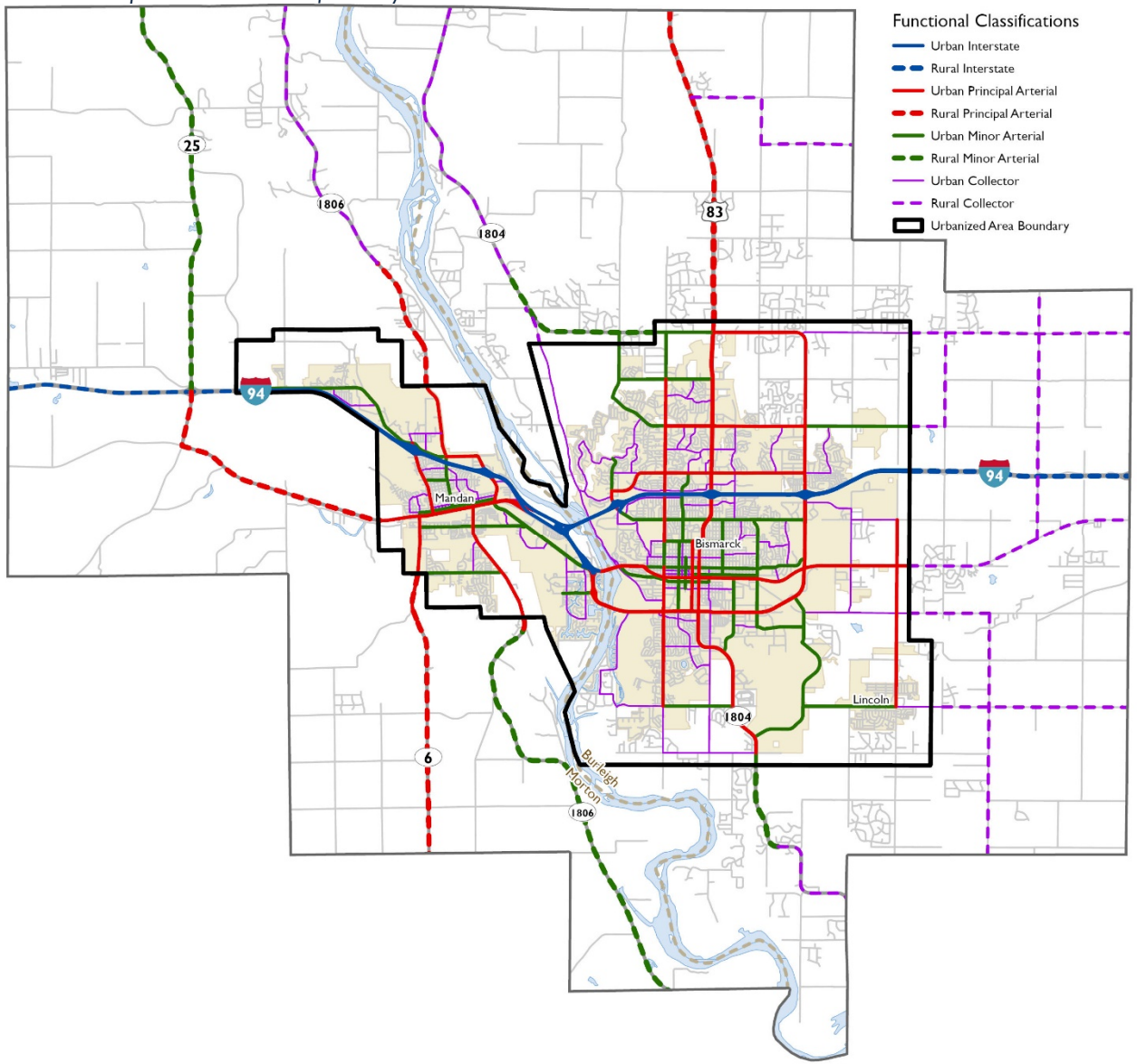
Functional classification is also used for planning purposes. Roadways identified under the federal functional classification system are considered part of the federal aid system, meaning they are eligible to receive federal funding for transportation-related improvements. The MPO area's proposed federal functional classification system is delineated between urban and rural functional classifications, which are determined based on the MPO's urban area boundary (UA); MPO roadways that fall in the UA are considered urban, while those outside the UA are considered rural. The MPO's proposed functionally classified system and UA are shown in **Figure 11**.

Figure 10: Accessibility and Mobility Characteristics of the Functionally Classified Roadway System



Source: Federal Highway Administration

Figure 11: Bismarck-Mandan MPO's Proposed Functional Classification System



Source: Bismarck-Mandan MPO, Burleigh County, North Dakota Department of Transportation

National Highway System

The NHS is a network of roadways that are deemed critical to the nation's economy, defense, and mobility. This network was developed through cooperation between the United States Department of Transportation (USDOT), states, local governments, and MPOs and consists of a series of subsystems.[1] The MPO roadways designated as part of the NHS are shown in **Figure 12**.

Roadway Jurisdiction

Roadway jurisdiction pertains to the primary agency responsible for the maintenance and operation of a roadway. For the Bismarck-Mandan MPO area, jurisdictions responsible for roadways include state, county, township, and local agencies. In the MPO area, the specific agencies responsible for maintaining and operating roadways include:

- **State Agencies:** NDDOT
- **County Agencies:** Burleigh and Morton Counties
- **Townships:** Hay Creek, Gibbs, and Apple Creek
- **Local Agencies:** Bismarck, Mandan, and Lincoln

Figure 13 shows the MPO roadways and their current jurisdictional agency.

[1] Federal Highway Administration, *National Highway System*

Figure 12: National Highway System Within the Bismarck-Mandan MPO Region

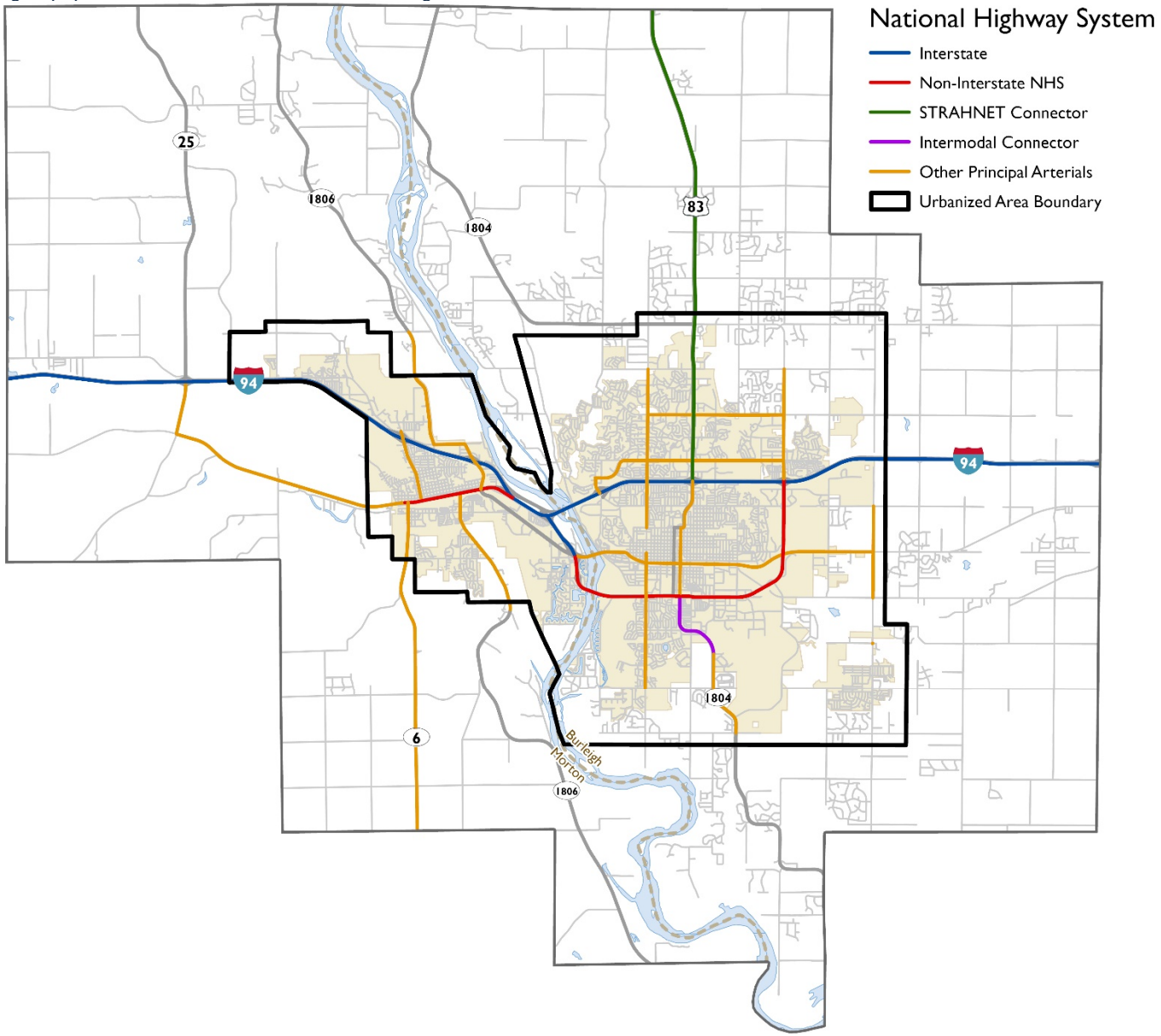
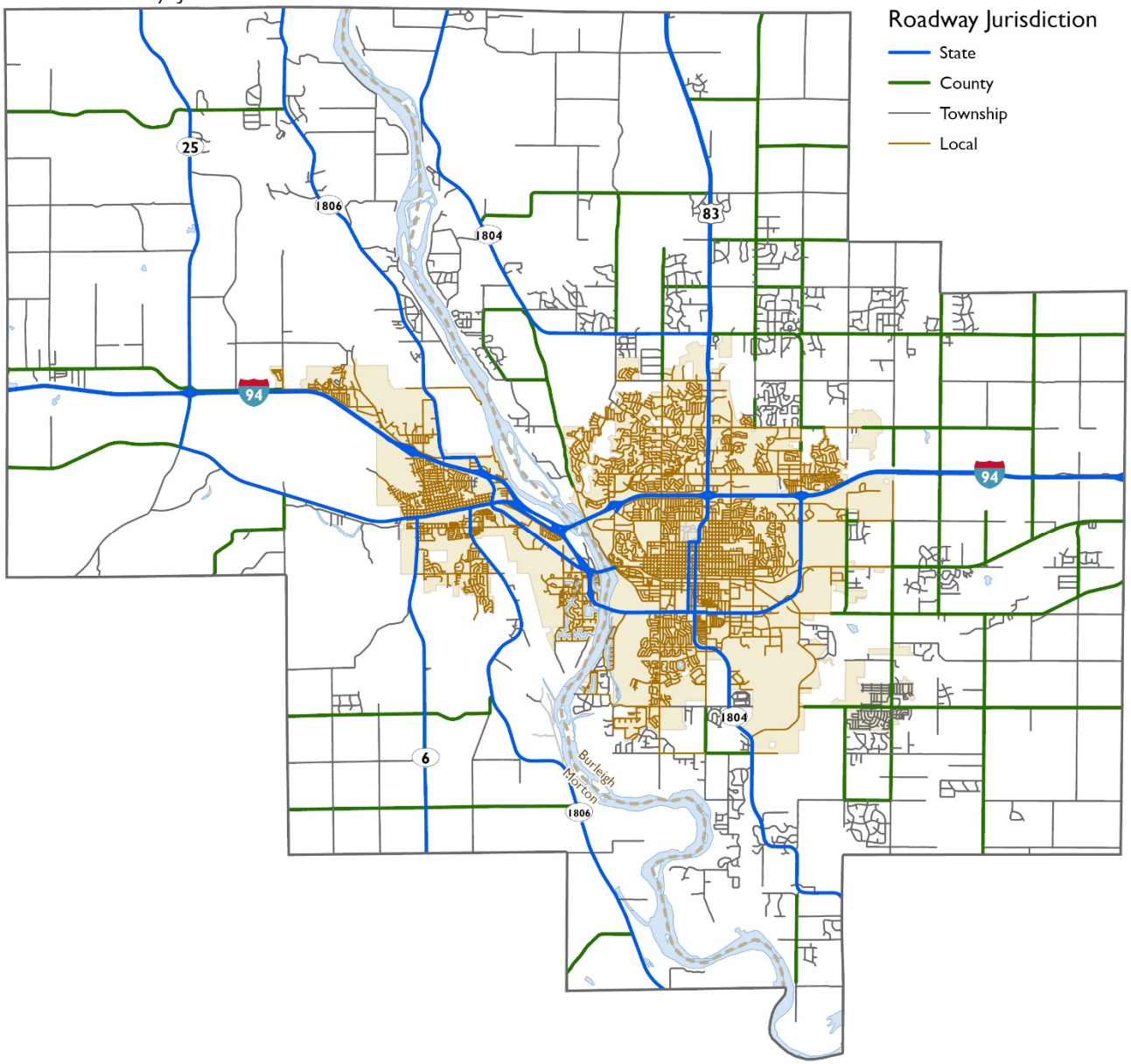


Figure 13: Bismarck-Mandan MPO Roadways Jurisdictions



Safety

Multimodal safety conditions for the Bismarck-Mandan MPO area were analyzed through a review of historic crash data, which spanned the years 2018–2022 and was sourced from NDDOT. This analysis focused on trends in the MPO area and on specific locations with the most crashes.

Annual Crash Trends

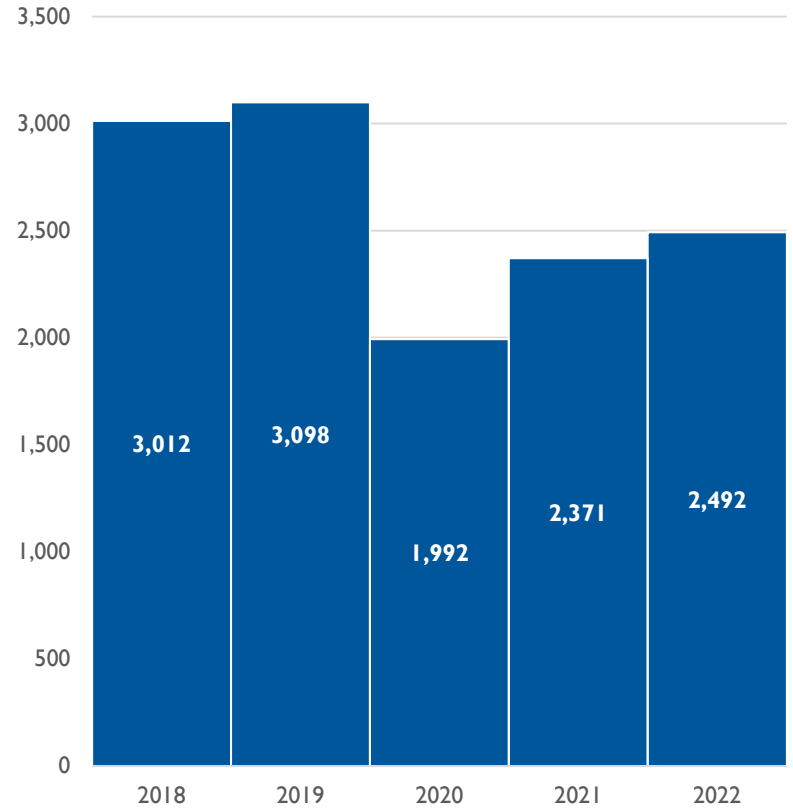
Annual MPO area crashes between 2018 and 2022 are shown in **Figure 14**.

Crash Severity

Crash severity refers to the most severe injury sustained by an individual because of a crash event. Currently, NDDOT uses five categories when determining crash severity:

- **Fatal crash**
- **Serious injury** crash (also referred to as incapacitating injury)
- **Minor injury crash** (also referred to as non-incapacitating injury)
- **Possible injury crash**
- **Property damage only** (PDO)

Figure 14: Annual Crashes Within the MPO Area, 2018–2022



Source: North Dakota Department of Transportation Data[2]

[2] NDDOT revised the reporting requirements of property- damage- only crashes in 2019.

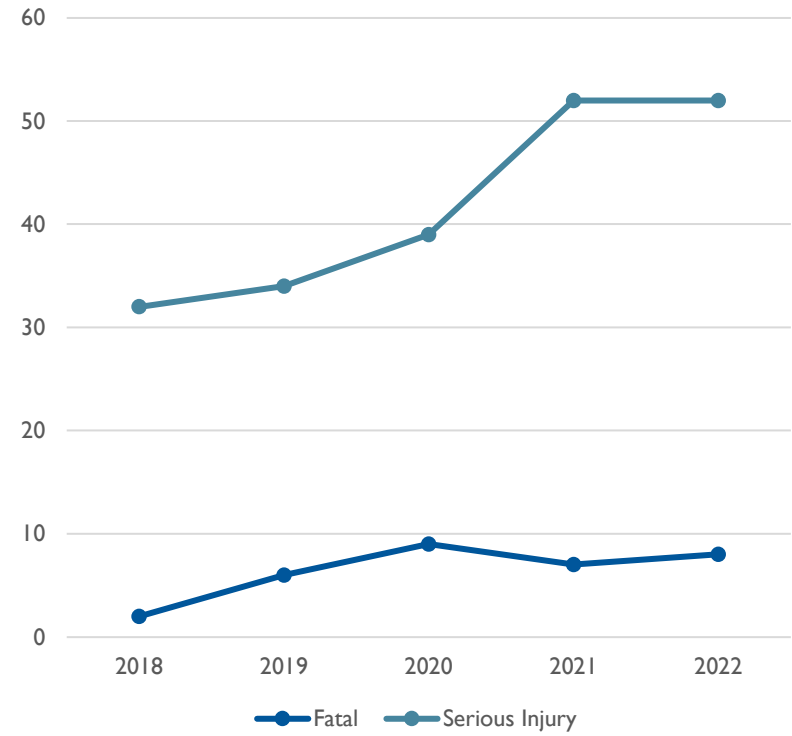
Table 13 summarizes crash severities by year for the MPO region. Between 2018 and 2022, there were 32 fatal crashes and 209 serious injury crashes in the region. Minor injury and possible injury crashes totaled 1,241 and 1,342, respectively, while PDO crashes were the most common severity with 10,141 recorded between 2018 and 2022. **Figure 15** provides more detailed look at the annual trends related to fatal and serious injury crashes between 2018 and 2022. **Figure 16** shows the locations of fatal and serious injury crashes that occurred in the MPO area between 2018 and 2022.

Table 13: Crashes by Severity, 2018–2022

Year	Fatal	Serious Injury	Minor Injury	Possible Injury	PDO	Total
2018	2	32	197	328	2,453	3,012
2019	6	34	233	329	2,496	3,098
2020	9	39	212	238	1,494	1,992
2021	7	52	287	258	1,767	2,371
2022	8	52	312	189	1,931	2,492
Total	32	209	1,241	1,342	10,141	12,965

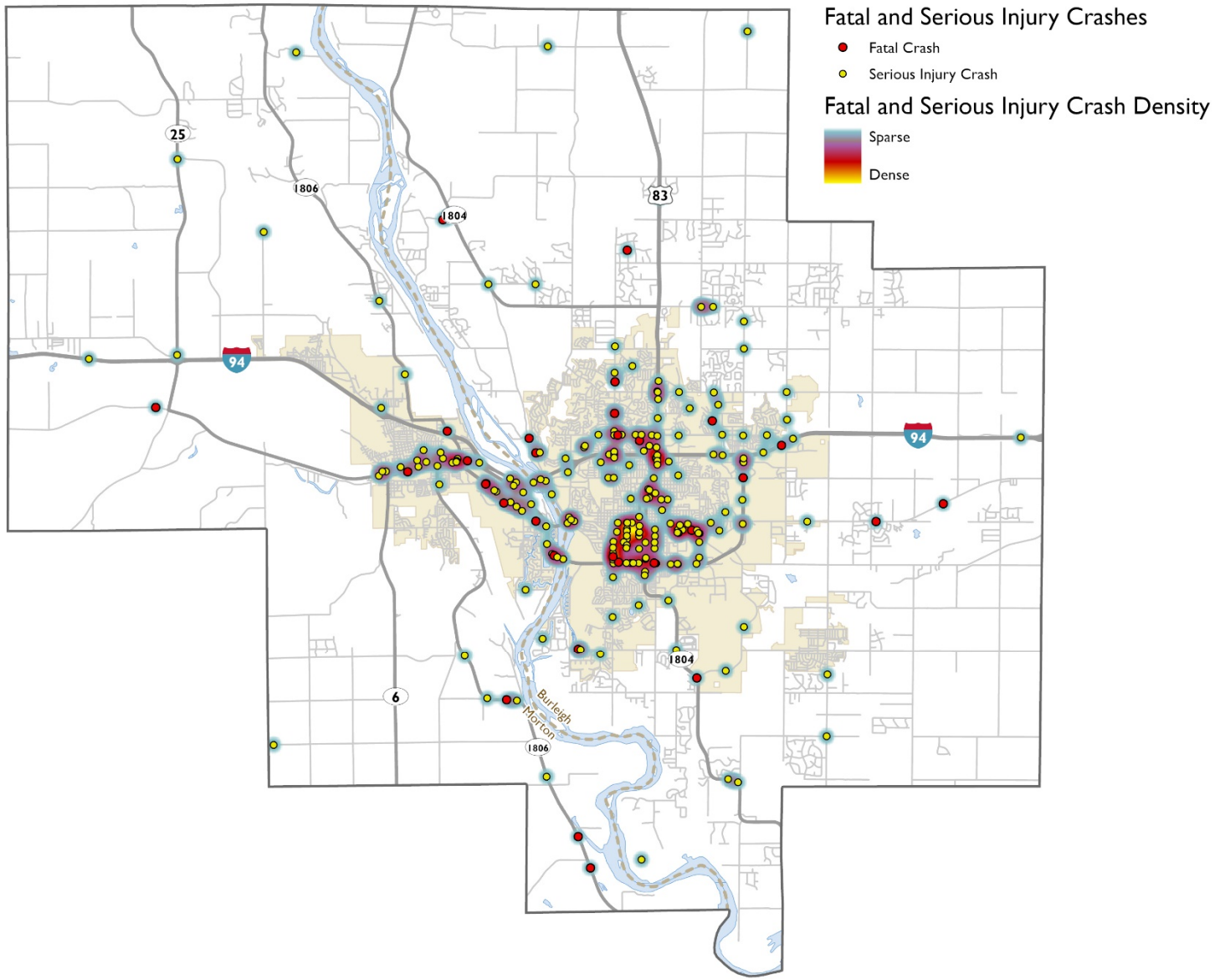
Source: North Dakota Department of Transportation Data

Figure 15: Annual Fatal and Serious Injury Crashes in the MPO Area, 2018–2022



Source: North Dakota Department of Transportation Data

Figure 16: Fatal and Serious Injury Crashes, 2018–2022



Source: North Dakota Department of Transportation Data

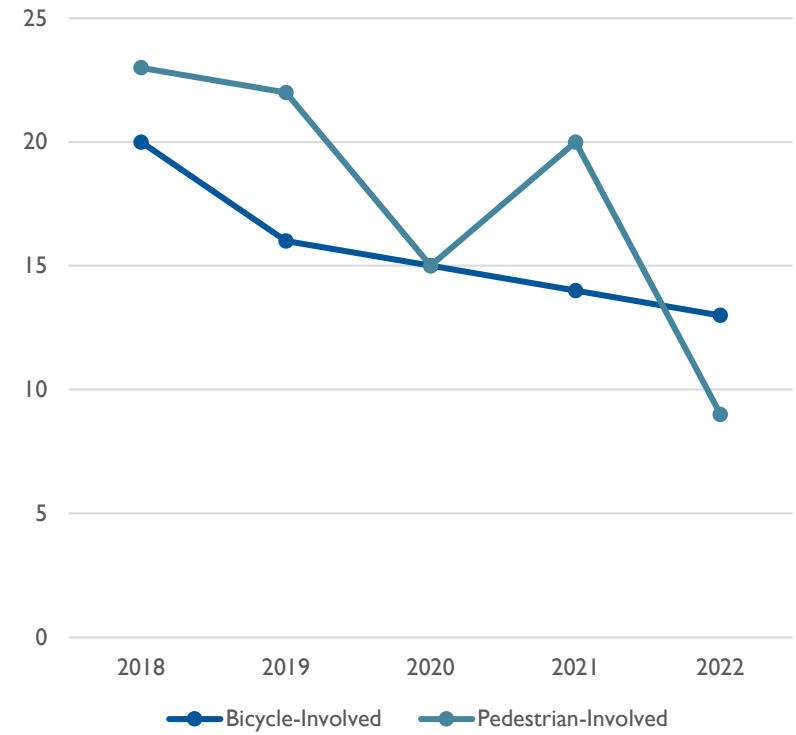
Intersection Crash Frequency

An intersection crash frequency analysis reviews intersection-related crashes so that they can be tied to specific locations in a study area. **Figure** *18* shows the locations of the top 20 crash frequency intersections. It is noted that roadway improvements to address crash history and overall traffic operations along State Street from Divide Avenue to Calgary Avenue were completed in 2023.

Bicycle and Pedestrian Safety Conditions

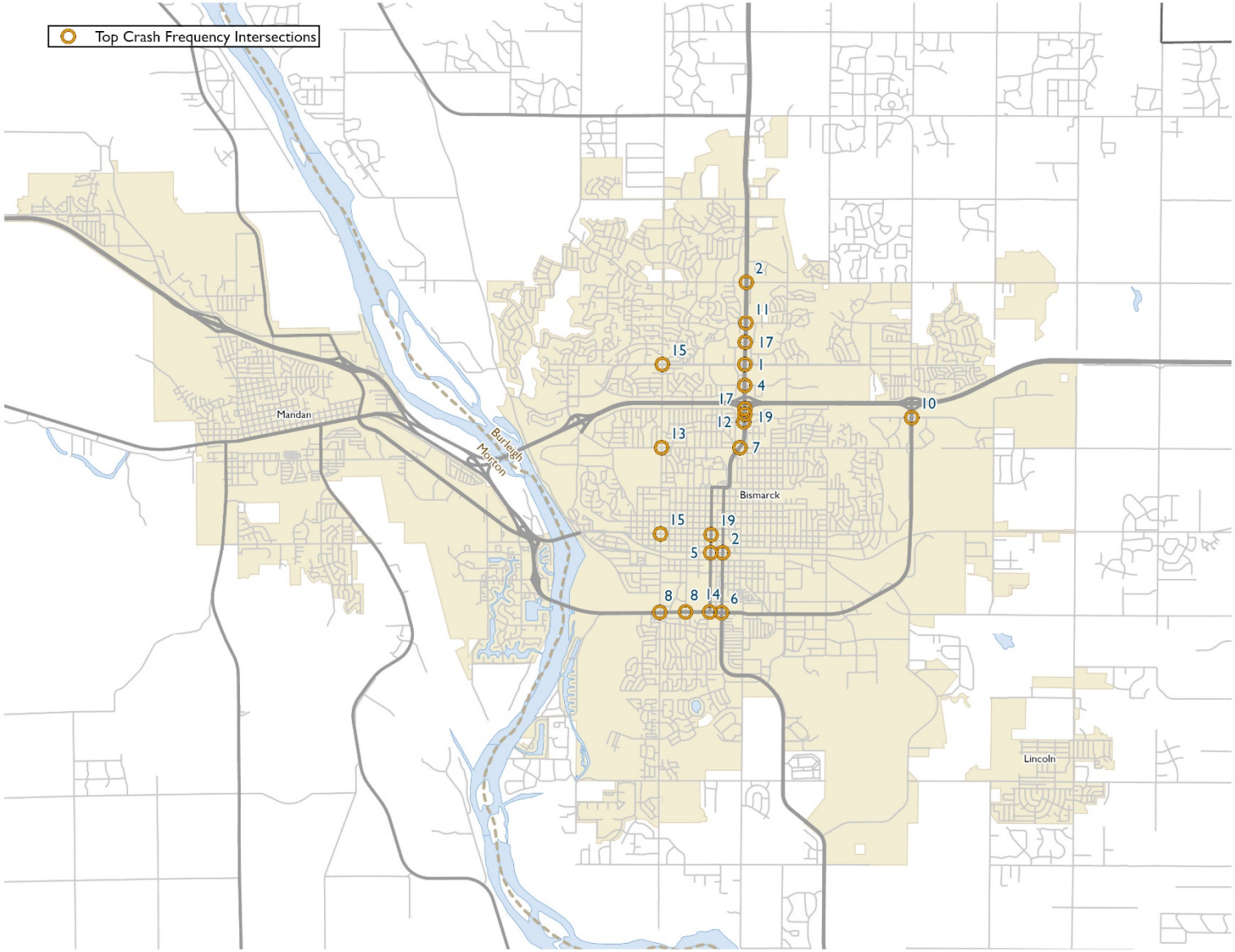
It is important to understand safety conditions for non-motorized users, including bicyclists and pedestrians. Historic bicycle and pedestrian crashes in the MPO area are summarized by year in **Figure 17**, while the locations of these crashes are shown in **Figure 19**.

Figure 17: Bicycle- and Pedestrian-Involved Crashes, 2018–2022



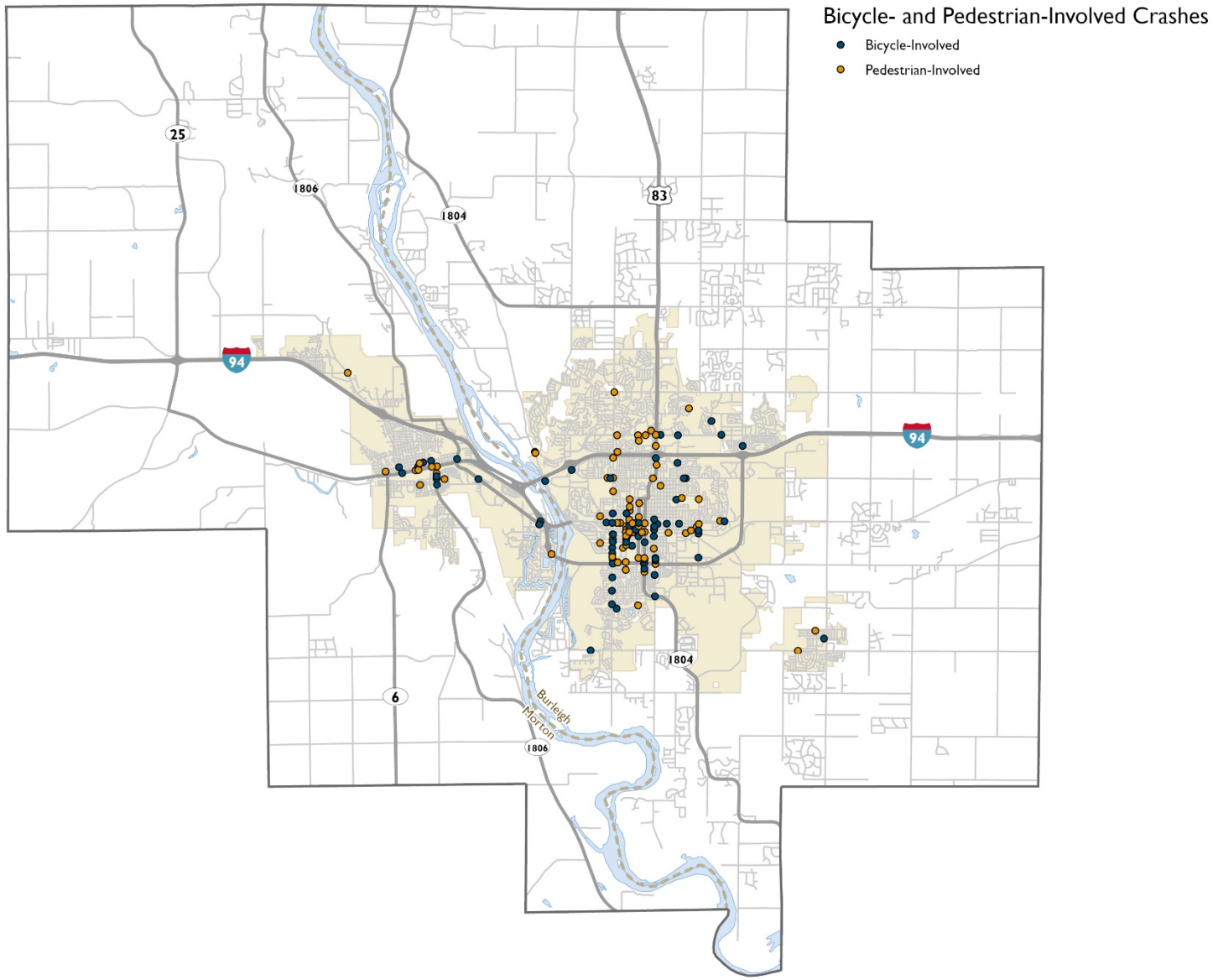
Source: North Dakota Department of Transportation Data

Figure 18: Top 20 Crash Frequency Intersections (2018–2022), Urban Inset



Source: North Dakota Department of Transportation Data

Figure 19: Bicycle- and Pedestrian-Involved Crashes, 2018–2022



Source: North Dakota Department of Transportation Data

Bicycle- and Pedestrian-Involved Fatal and Serious Injury Crashes

Table 14 summarizes fatal and serious injury crashes that involved bicyclists and pedestrians.

Table 14: Bicycle- and Pedestrian-Involved Crashes Fatal and Serious Injury Crashes, 2018–2022

Type	2018	2019	2020	2021	2022	Total
Fatal						
Bicycle-Involved	0	1	0	0	0	1
Pedestrian-Involved	0	0	1	2	2	5
Serious Injury						
Bicycle-Involved	2	1	4	3	0	10
Pedestrian-Involved	1	4	2	7	2	16

Source: North Dakota Department of Transportation Data

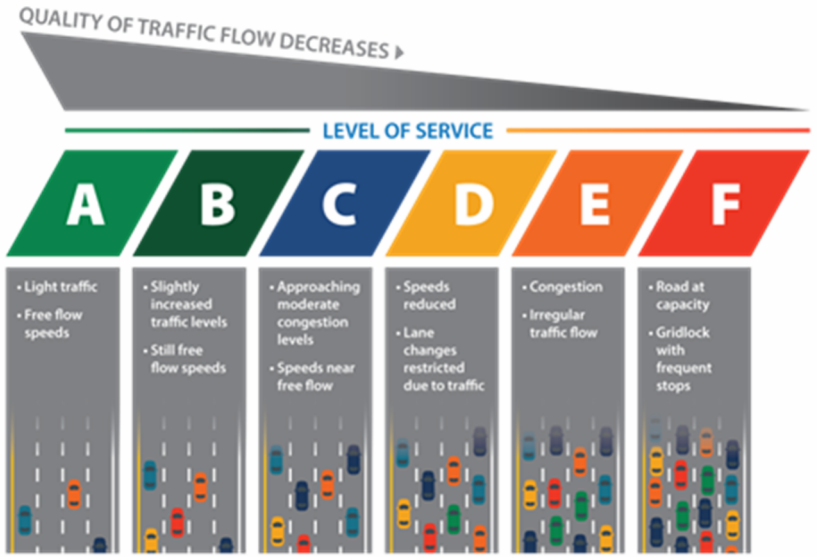
Traffic Operations

Baseline traffic operations for roadways in the MPO area were analyzed to identify the corridors experiencing congestion.

Planning Level of Service

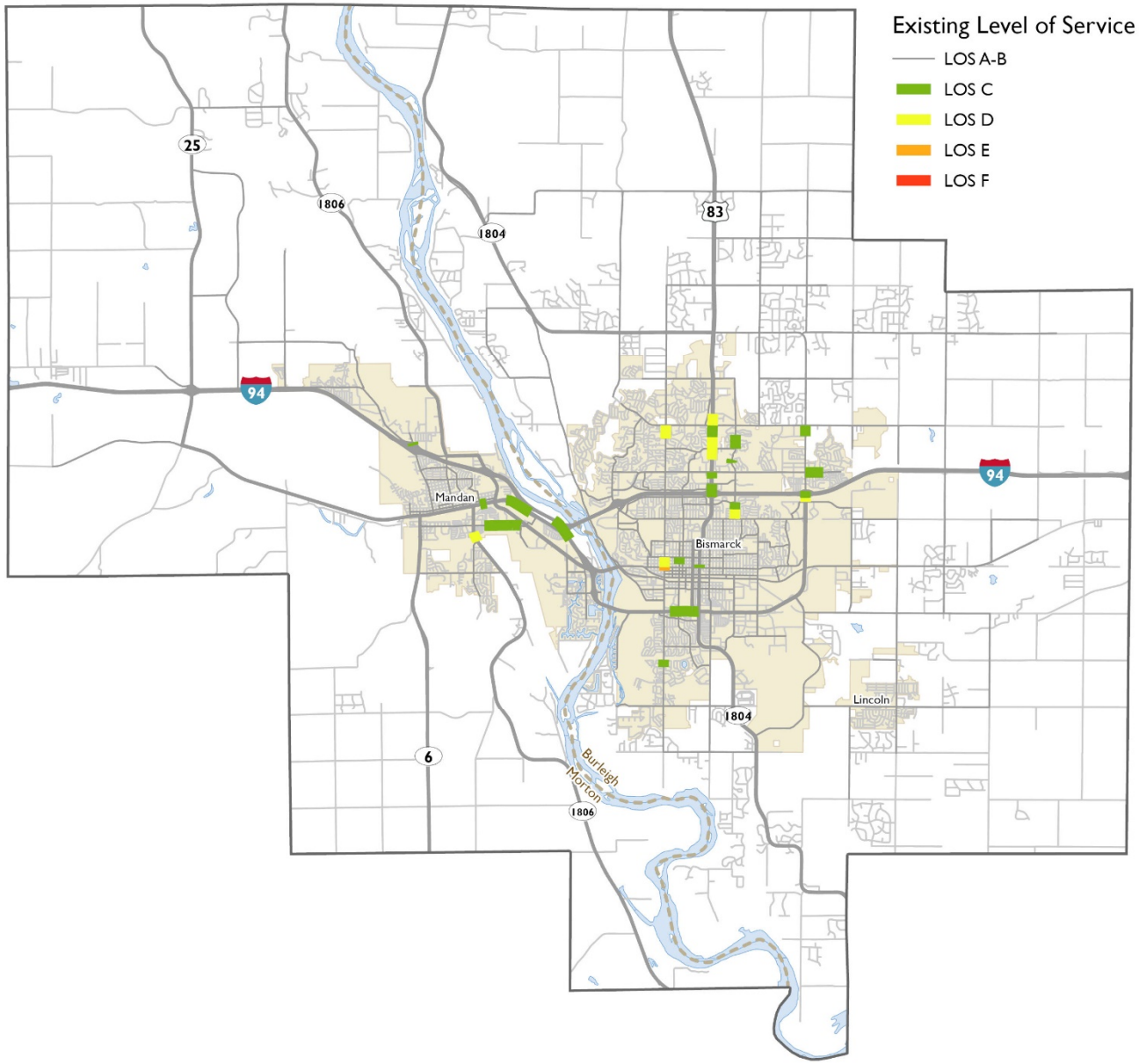
Planning level of service (LOS) is a high-level estimate of peak hour traffic operations that compares the level of observed traffic with a street's capacity to carry traffic. This approach describes the roadway's LOS with grades between "A," indicating free-flow conditions, and "F," indicating complete gridlock. **Figure 20** details each LOS grade and **Figure 21** provides a summary of current levels of service in the study area.

Figure 20: Level of Service Definitions



The current estimated LOS for the streets in the MPO area is shown in **Figure 21**.

Figure 21: Existing Planning Level of Service for the Bismarck-Mandan MPO Area



Travel Reliability

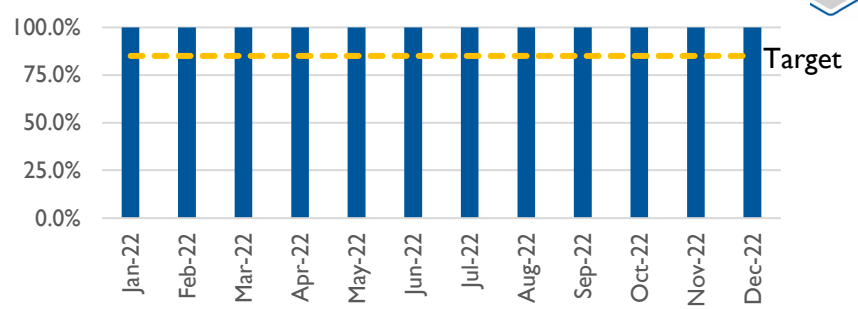
Travel reliability measures the predictability of travel times along a corridor. This traffic operations measure differs from the other because it focuses on consistency; a corridor identified as being congested can still be deemed reliable if that congestion is consistent and predictable to travelers who can plan their travel around it. It is measured for passenger vehicles with a metric called Level of Travel Time Reliability (LOTTR) and measured for freight traffic with a metric called Truck Travel Time Reliability Index (TTTR).

Figure 22 and **Figure 23** summarize progress made on the interstate system and non-interstate NHS toward these targets, respectively. Both figures show that reliability targets were met for all months in the MPO area.

Truck Travel Time Reliability Index

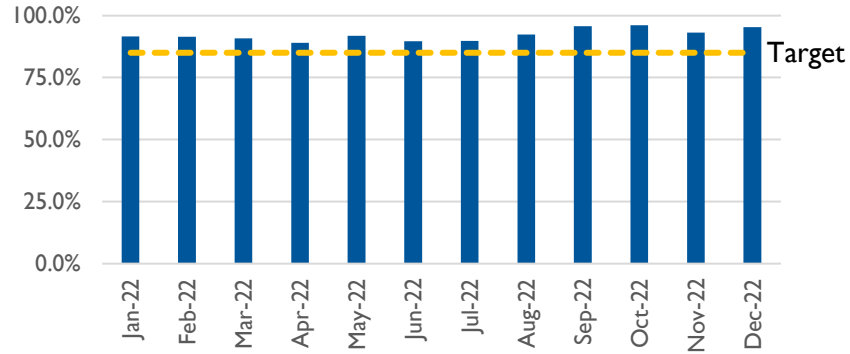
TTTR indicates the reliability of travel for freight trucks along the interstate system. TTTR data sourced from the NPMRDS for the year 2022 was used to calculate the TTTR index for I-94 in the MPO area. **Figure 24** shows the resulting TTTR index for the interstate in the MPO area. The desired target is a TTTR of 1.5 or lower.

Figure 22: Percent of Person-Miles Traveled that Were Reliable by Month for the Interstate System, 2022



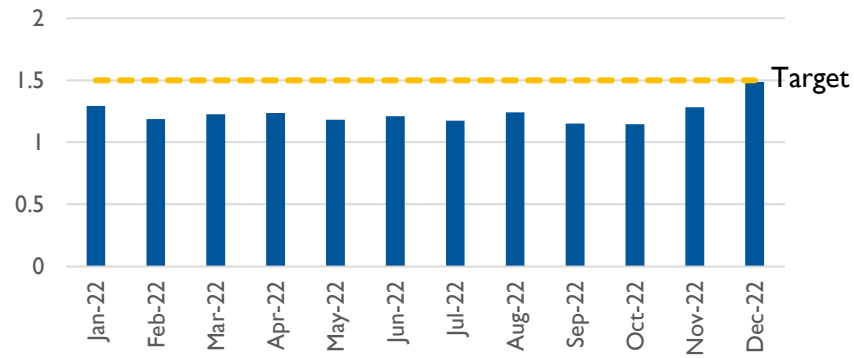
Source: National Performance Management Research Dataset, 2022

Figure 23: Percent of Person-Miles Traveled that Were Reliable by Month for the Non-Interstate NHS, 2022



Source: National Performance Management Research Dataset, 2022

Figure 24: Monthly TTTR for the Interstate System, 2022



Source: National Performance Management Research Dataset, 2022

Cross-Area Travel: Baseline Issues

Cross-area travel has been identified as a significant issue throughout multiple metropolitan transportation plan updates. Specifically, these travel patterns have historically been identified as problematic on each side of the river:

- North-South travel in Bismarck
- East-West travel in Mandan

Some of the cross-area travel issues include the following:

- **Barriers to continuous corridors**: Several natural and man-made barriers create discontinuous corridors in the area. These include I-94, the Missouri River, the Heart River, the Hay Creek, the BNSF railroad, the DMVW railroad, and topographical constraints. In some cases, the barriers are due to the lack of a dedicated, continuous arterial corridor, and land development has blocked the opportunity for a public right-of-way to continue the arterial corridor.
- **Arterial access levels**: Several arterial corridors in both communities have dense private driveway access that can lead to safety and travel reliability issues. Many corridors are adjacent to residences, which creates a conflict between efficient vehicular movement and livability/community quality.

Freight System

Freight plays a key role in the Bismarck-Mandan region's economy by facilitating the movement of goods through the area. The main freight assets found in the MPO region are the network of federal, state, and local truck routes that provide mobility and accessibility for highway freight movements and rail lines that support rail freight movements. The local, state, and federal truck routes are shown in **Figure 30**.

Freight Rail Assets

Rail operations are a vital component of the freight system and the overall multimodal transportation network. The intersection of rail lines with roadways presents safety and mobility concerns when these crossings are at-grade owing to potential collisions and vehicle delays during train crossing events.

Freight railroads in North Dakota facilitate the movement of large quantities of commodities across the state. The locations of the MPO freight rail assets are shown in **Figure 26**.

Rail Lines

Rail operations serving the Bismarck-Mandan MPO area are operated by BNSF and Dakota, Missouri Valley, and Western Railroad (DMVW).

Rail Crossings

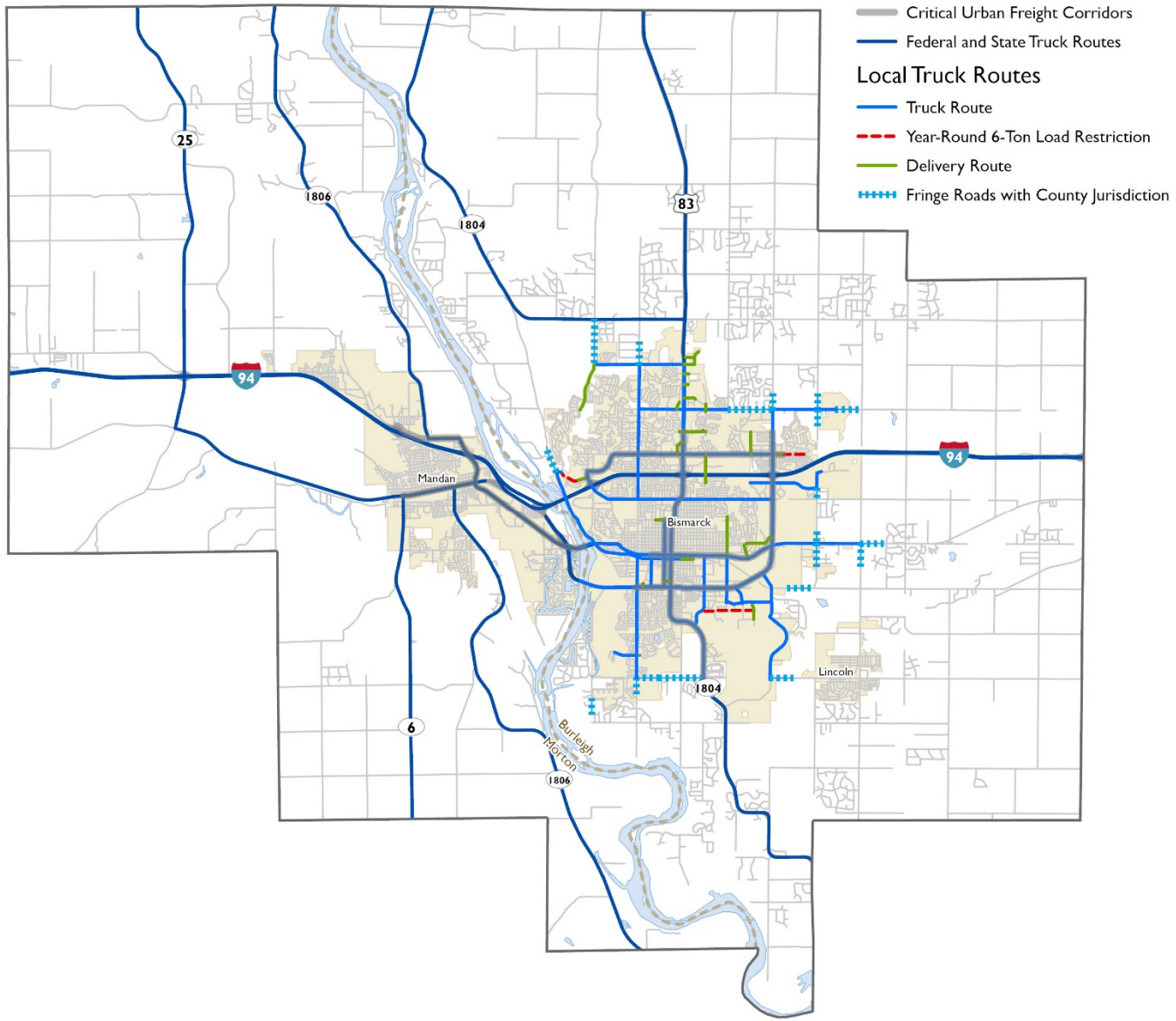
A total of 65 public rail crossings are located in the Bismarck-Mandan MPO area. Of these 65 public crossings, 48 are at-grade, while the remaining crossings are grade separated with the railroad either passing over (overpass) or under (underpass) roadways.

Table 15 summarizes the current rail operations in the MPO area, including trains per day, miles of track, and public rail crossings for the BNSF and DMVW railroads.

Table 15: Existing BNSF and DMVW Operations in the MPO Area

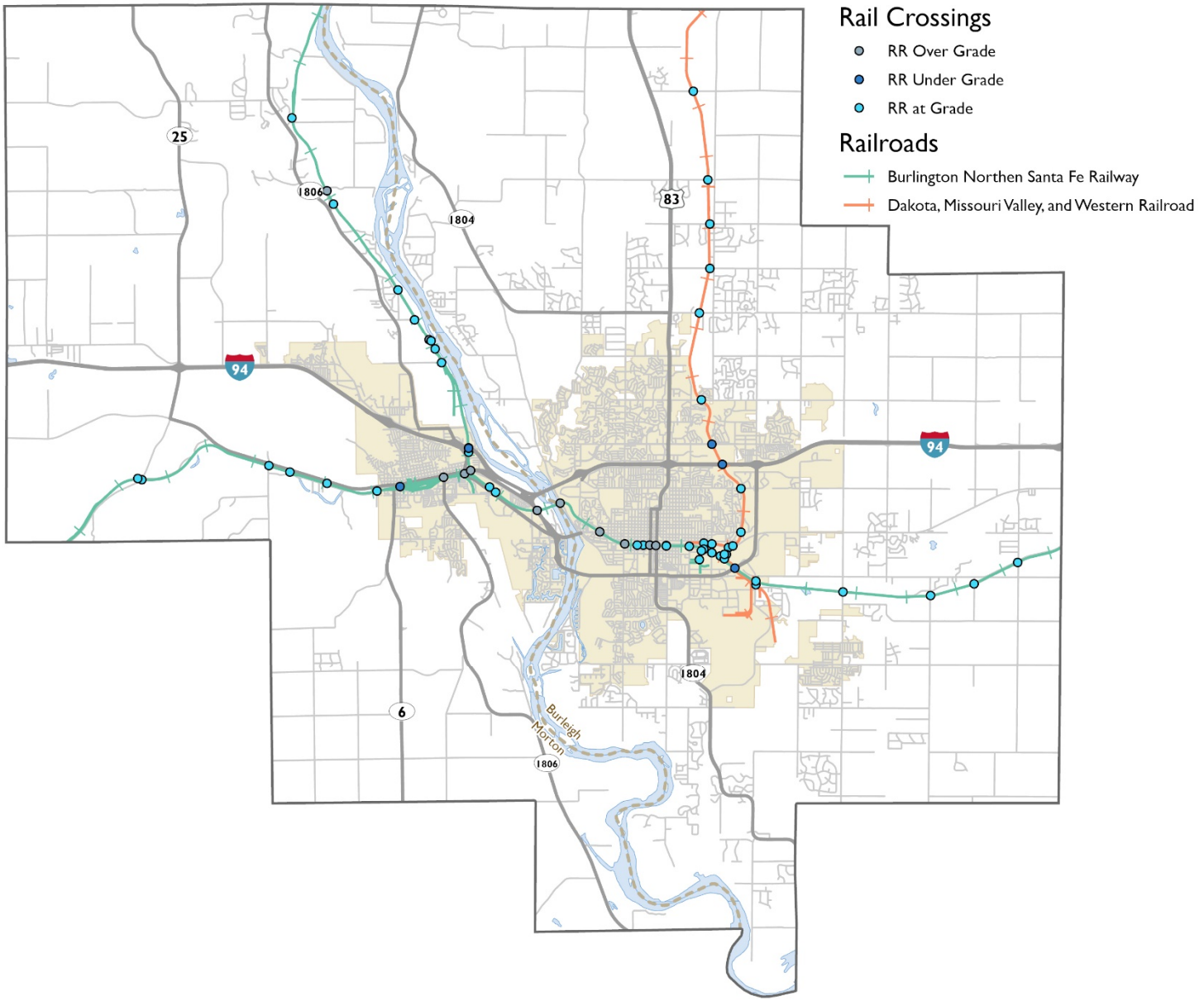
	BNSF	DMVW
Trains per Day	4-22	1
Miles of Track	57.5	17.9
At-Grade Crossings	30	18
Grade-Separated Crossings	15	2

Figure 25: Federal, State, and Local Truck Routes



Source: City of Bismarck, February 2024

Figure 26: Rail Lines and Public Rail Crossings in the MPO Region

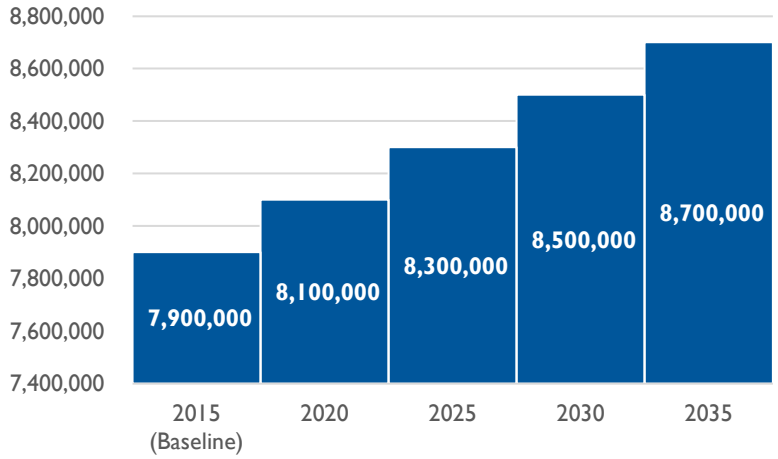


Air Freight

Air freight services in the Bismarck-Mandan MPO area are facilitated through the Bismarck Municipal Airport, which is designated as a Level One facility per NDDOT's Strategic Freight System Index based on the cargo movements through the airport that are carried on commercial services.

Forecasts of cargo operations at the Bismarck Municipal Airport through the year 2035 are shown in **Figure 27** project that nearly 9 million pounds of cargo will move through the airport in 2035.

Figure 27: Forecasted Air Cargo Operations at the Bismarck Municipal Airport, 2015–2035



Source: City of Bismarck, *Airport Master Plan*

Bicycle and Pedestrian System

The bicycle and pedestrian system in the Bismarck-Mandan MPO region is an important network of off-street and on-street facilities that provide users with non-motorized mobility and access to the region's destinations.

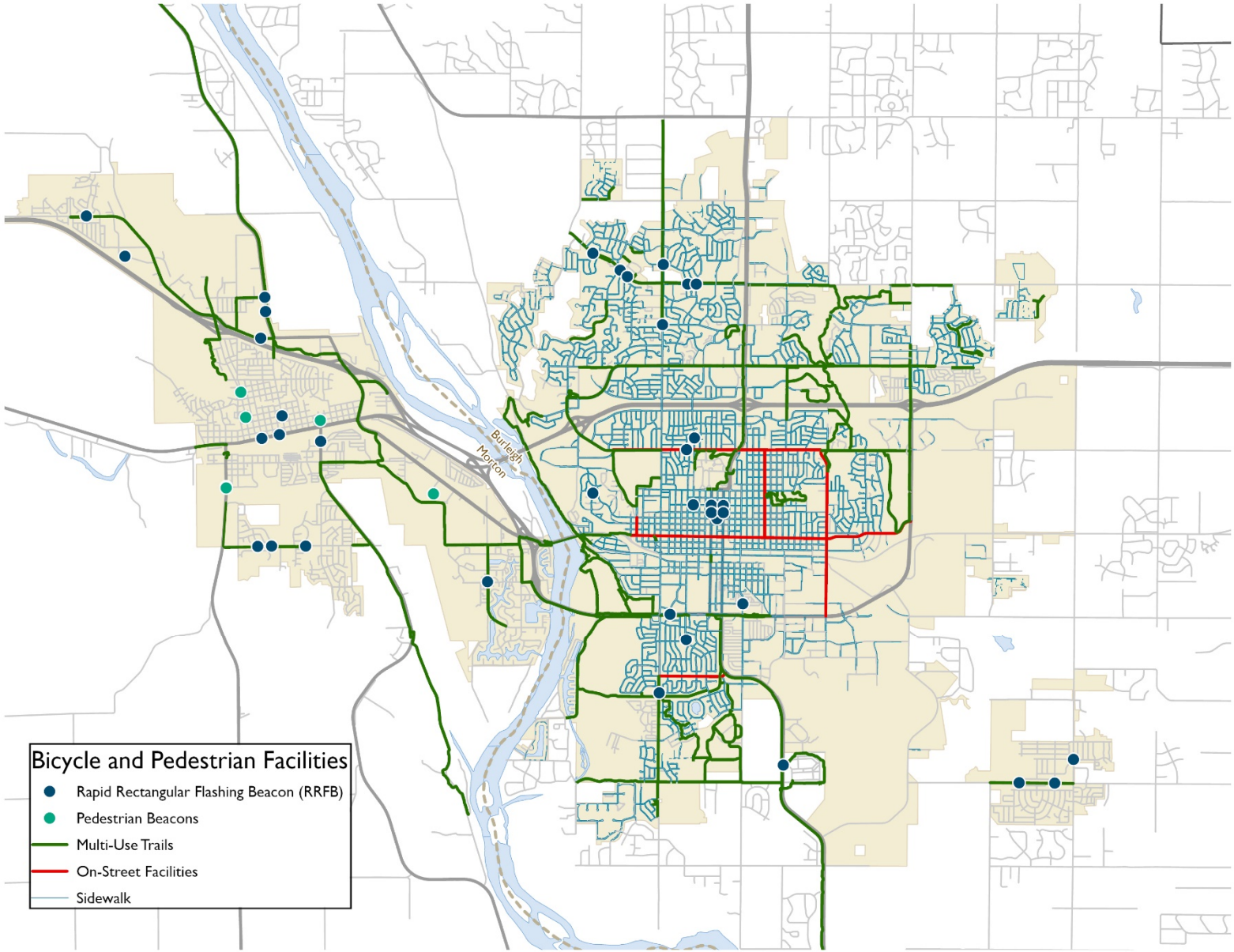
Existing Bicycle and Pedestrian Facilities

The existing bicycle and pedestrian infrastructure found in the Bismarck-Mandan MPO region consists of off-street facilities that provide infrastructure separated from vehicular traffic and on-street facilities that are located in the roadway adjacent to vehicular travel lanes. The existing off-street facilities include sidewalks and multiuse trails, while the on-street facilities include bicycle lanes and shared road routes. In addition to these facilities, several rapid rectangular flashing beacons are found throughout the region. A description of each facility is in **Table 16**, and their locations in the MPO region are shown in **Figure 28**.

Table 16: Existing Bicycle and Pedestrian Infrastructure in the Bismarck-Mandan MPO Area

Facility Type	Description
Sidewalks 	A paved pedestrian facility located along a street. Sidewalks are located on most streets in Bismarck, typically on both sides of the street after a property is developed.
Multiuse Trails 	Separated from the roadway and used for bicycling, walking, running, or other non-motorized activities. There are multiuse trails in both Bismarck and Mandan, many of which continue past city limits into Morton and Burleigh Counties.
Bicycle Lanes 	A dedicated portion of roadway space for preferential or exclusive use by bicyclists. Some roads in Bismarck include dedicated bicycle lanes, which are between 4 and 6 feet wide and marked with paint.
Shared Road Routes 	Lower speed and lower volume roads that use signage and lane markings to indicate that the roadway space is intended to be shared by all users. Some residential and collector roads in Bismarck are marked with Share the Roads signs and/or street markings to encourage motorists to make space for bicyclists.
Rapid Rectangular Flashing Beacons 	Crossing treatments applied at uncontrolled, marked crosswalks that provide flashing lights as indicators to alert motorists of pedestrian usage of the crossing.

Figure 28: Existing Bicycle and Pedestrian Facilities, Urban Inset



Transit System

Public transit service in the Bismarck-Mandan MPO region is provided by Bis-Man Transit.

Fixed-Route Service

Capital Area Transit (CAT) operates fixed-route service in the MPO region. CAT operates six regular fixed routes on weekdays and Saturdays. The routes are shown in **Figure 30**.

Paratransit Service

Paratransit door-to-door services are available to senior citizens 70 years of age or older and to individuals with any type of certifiable disability. This service operates in the city limits of Bismarck, Mandan, and Lincoln; on the University of Mary campus; and within .75 mile from fixed-route service.

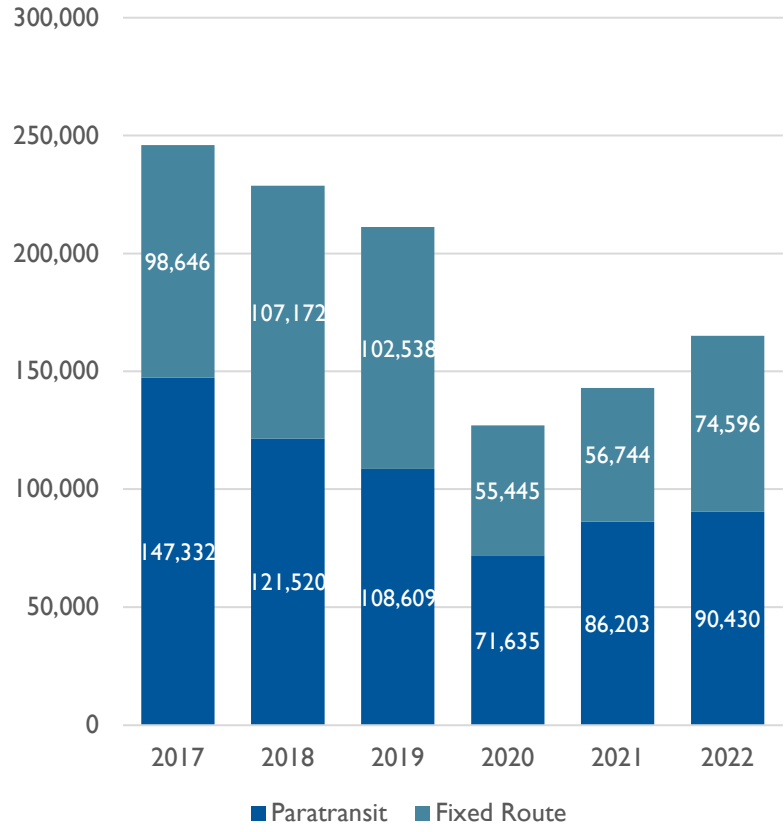
Fixed-route and paratransit ridership have followed the same trends in recent years (**Figure 29**).

Passenger Rail

Passenger rail service is currently not offered in the MPO area. The nearest passenger rail station, operated by Amtrak, is located in Minot, North Dakota, which is located approximately 100 miles north of the Bismarck-Mandan area.

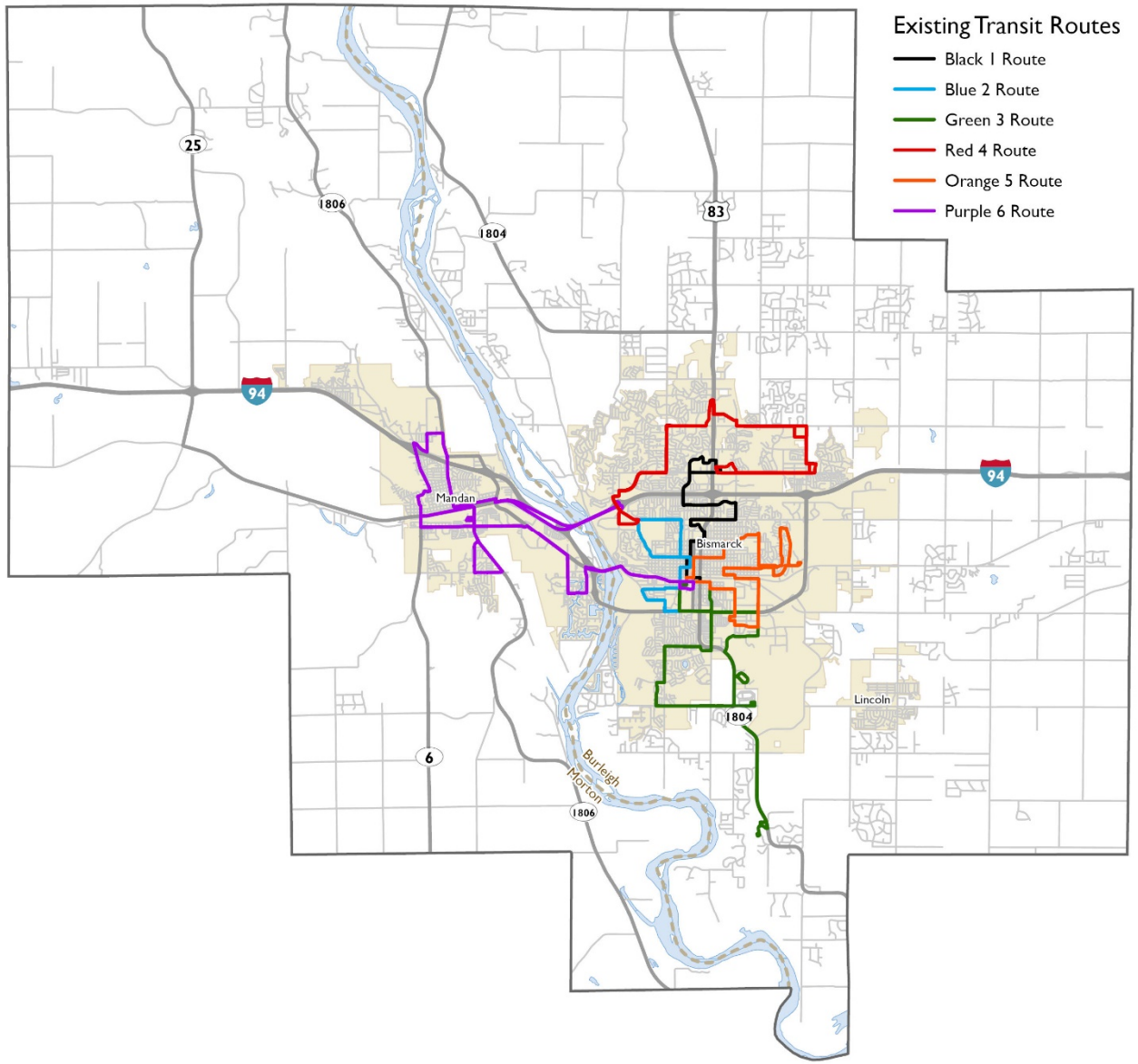
Efforts are underway to reinstate passenger rail on the formerly operating North Coast Hiawatha line, which previously ran through the Cities of Mandan and Bismarck. The line's sponsor—Big Sky Passenger Rail Authority (BSPRA)—has applied for and received admittance into the Corridor ID program. Corridor ID is a 3-step program, accompanied by modest federal funds, to assist in the planning and administration of reinstating the rail line for passenger travel. BSPRA hopes to have passenger rail reinstated from Seattle to Chicago along the former North Coast Hiawatha line by 2032. If this is successful, there is a possibility that a passenger rail stop will occur within the MPO region.

Figure 29: Ridership by Mode, 2017–2022



Source: Federal Transit Administration, National Transit Database

Figure 30: Current Fixed-Route Network



Source: Capital Area Transit

Passenger Aviation

Passenger aviation services are available at two locations in the MPO area: the Bismarck Municipal Airport and the Mandan Regional Airport.

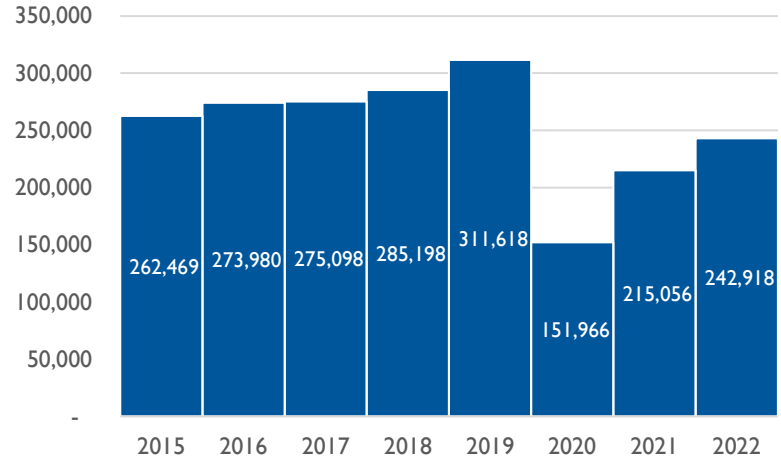
Bismarck Municipal Airport

The Bismarck Municipal Airport is on North Dakota Highway 1804 (ND 1804) and University Drive. Allegiant, American, Delta, and United airlines provide round-trip commercial service to locations including Chicago, Dallas/Fort Worth, Orlando/Sanford, Denver, Las Vegas, Minneapolis/St. Paul, and Phoenix/Mesa.[3] **Figure 31** summarizes historic enplanements for commercial service at the Bismarck Municipal Airport.

Mandan Regional Airport

The Mandan Regional Airport, located south of Mandan city limits, is one of North Dakota's busiest general aviation facilities. It averages 70 flights per day, with 60 percent of flights being general aviation, 33 percent transient general aviation, 2 percent military, and 4 percent air taxi.[4]

Figure 31: Historic Passenger Enplanements for the Bismarck Municipal Airport, 2015–2022



Source: Federal Aviation Administration, Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports

Source: Bismarck Airport

[3] Bismarck Airport, *Master Plan Update*

[4] City of Mandan, *Mandan Regional Airport-Lawler Field*

Asset Conditions

Asset condition refers to the MPO's roadway pavement and bridge infrastructure.

Pavement Condition

The 2020 Bismarck-Mandan MPO "State of Streets" report surveyed streets across the metro area. According to the 2020 report, roadways surveyed were found to be in overall "adequate" condition with an average Pavement Condition Index (PCI) of 80, as shown in **Table 17**.

Table 17: Bismarck-Mandan MPO's Pavement Condition Categories

Category	Typical Distresses and Typical Level of M&R* Needed	PCI Range
Adequate	More extensive longitudinal and transverse cracking and weathering of surface ***Preventative maintenance:*** *Crack sealing and surface treatments*	71–100
Degraded	Extensive longitudinal and transverse cracking, early-stage alligator (fatigue) cracking, early-stage rutting, and weathering of surface ***Global preventative maintenance and localized repairs:*** *Localized surface and/or full-depth patching, surface treatments, and thin overlays*	56–70
Unsatisfactory	More extensive and more severe longitudinal and transverse cracking, alligator (fatigue) cracking, rutting, weathering of surface, potholes ***Major rehabilitation:*** *Full-depth patching, mill and overlays, traditional overlays, and reconstruction*	0–55

Source: Bismarck-Mandan MPO, *2020 State of the Streets*
*M&R refers to Maintenance and Rehabilitation

Table 18 shows the surveyed PCI by community.

Table 18: Average Pavement Conditions by Jurisdiction

Jurisdiction	Centerline Miles	PCI	PCI Category	IRI	IRI Category
City of Bismarck	126.4	79.6	Adequate	196	Smooth
City of Lincoln*	1.4	80.4	Adequate	111	Smooth
City of Mandan	37.6	78.9	Adequate	243	Marginally Rough
Burleigh County	42.1	79.3	Adequate	125	Smooth
Morton County	14.9	89.3	Adequate	88	Smooth
Total	**222.3**	**80**	**Adequate**	**185**	**Smooth**

*The City of Lincoln's roadway inventory is managed by Burleigh County
Source: Bismarck-Mandan MPO, *2020 State of the Streets*

Bridge Condition

Bridges are critical transportation assets that provide mobility in areas where geographic features such as rivers and rail lines create physical barriers. Data provided by the National Bridge Inventory was reviewed to determine the current condition of bridges and culverts located in the MPO region, which is summarized in **Table 19**. **Table 20** provides the condition of bridges and culverts found on the interstate or non-interstate NHS.

Table 19: Condition of MPO Area Bridges and Culverts

Condition	MPO Area Bridges		MPO Area Culverts	
	Count	Percent	Count	Percent
Good	40	58.8%	11	44.0%
Fair	26	38.2%	14	56.0%
Poor	2	2.9%	0	0%
Total	68		25	

Source: National Bridge Inventory

Table 20: Condition of Interstate and Non-Interstate NHS Bridges and Culverts

Condition	Interstate and non-Interstate NHS Bridges		Interstate and non-Interstate NHS Culverts	
	Count	Percent	Count	Percent
Good	16	45.7%	1	20.0%
Fair	19	54.3%	4	80.0%
Poor	0	0%	0	0%
Total	35		5	

Source: National Bridge Inventory

Environmental Baseline Review

A high-level summary of environmental resources present in the Bismarck-Mandan MPO area was conducted to understand the potential impacts of transportation improvements. This includes assessing how to avoid negatively impacting any resources and/or identifying potential mitigation strategies.

The mitigation materials in the Appendix discuss strategies in the categories of:

- **Archaeological and Historical Resources**
- **Wetlands and Waters of the United States**
- **Floodplains**
- **Threatened and Endangered Species**
- **Section 4(f) and Section 6(f) Resources**
- **Environmental Justice**

Summary of System Issues

The analysis of the existing multimodal transportation system provides insight into the current issues and needs facing the Bismarck-Mandan MPO area. The issues and needs identified are shown below.

Area	Issues
Safety	Frequent crashes along higher-volume arterials
Traffic Operations	AM and PM peak hour congestion today due to high numbers of road users, future growth expected to lead to additional congestion.
Freight	High freight-generation highlights the need to provide efficient connections among freight destinations
Bicycle and Pedestrian	Current bicycle and pedestrian network provides a strong foundation for future expansion for increased access to community destinations
Transit	Transit ridership saw significant declines in 2020 and has begun to recover toward pre-2020 levels.
Pavement and Bridge Conditions	Some areas of pavement and bridge issues, but community has maintenance plans in place
Cross-Area Travel	Barriers to continuous corridors and high levels of arterial access impact: • **North-South** travel in Bismarck • **East-West** travel in Mandan

Future Transportation System Trends and Needs

A Growing Region

A key input to assessing future demand for the MPO's transportation network relates to socioeconomic indicators including population, housing, and employment. These indicators drive travel demand as residents and workers in the MPO area rely on the multimodal transportation system for their daily work commutes and retail, recreational, and other trip purposes. As the MPO area continues to grow, an increasing number of residents and workers leads to more trip making. This added transportation system demand can exacerbate the operational and safety issues into the future.

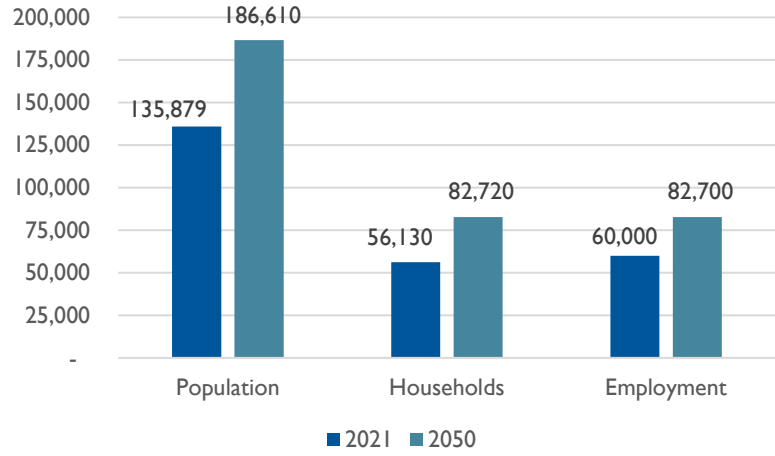
This chapter summarizes the socioeconomic forecasts developed as part of the MTP process and details how the future transportation system is expected to operate under a no-build scenario in which the only improvements made to the Bismarck-Mandan area's roadway network are those currently programmed in the MPO's TIP and the Capital Improvement Programs of the MPO's member jurisdictions.

Estimated Growth in Population, Households, and Employment

Future socioeconomic growth in the Bismarck-Mandan MPO region was forecasted to support the MPO's travel demand model (TDM), which is a tool that utilizes a series of mathematical procedures and calculations to estimate travel based on where people live and work and the transportation network available. It is calibrated to current conditions and used as a forecasting tool to estimate how future residents and workers will travel to their jobs and for shopping, retail, recreational, and other trip purposes.

Figure 32 summarizes the estimated growth in the MPO's population, number of households, and number of workers between 2021 and 2050. As **Figure 32** shows, the MPO's population is expected to grow at approximately 1.1 percent per year between 2021 and 2050. The rate of household growth and employment growth is expected to be 1.3 percent per year between 2021 and 2050.

Figure 32: Socioeconomic Forecasts for the Bismarck-Mandan MPA Area, 2021–2050



Source: Bismarck-Mandan MPO, *Arrive 2050 Forecasts: Travel Demand Model Socio-Economic Update*

Figure 33 illustrates where growth in future households is anticipated to occur based on future land use plans for the MPO's member jurisdictions. Household growth is shown in **Figure 33** by transportation analysis zones, the base geographies used for the TDM. **Figure 34** shows where growth in future employment is anticipated to occur throughout the MPO region.

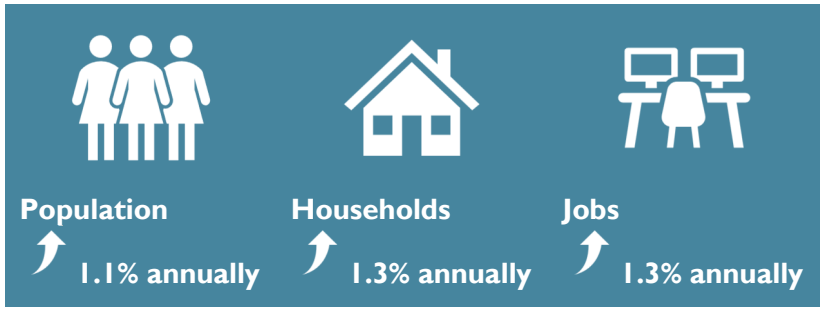


Figure 33: Forecasted Growth in Households for the Bismarck-Mandan MPO Region, 2021–2050

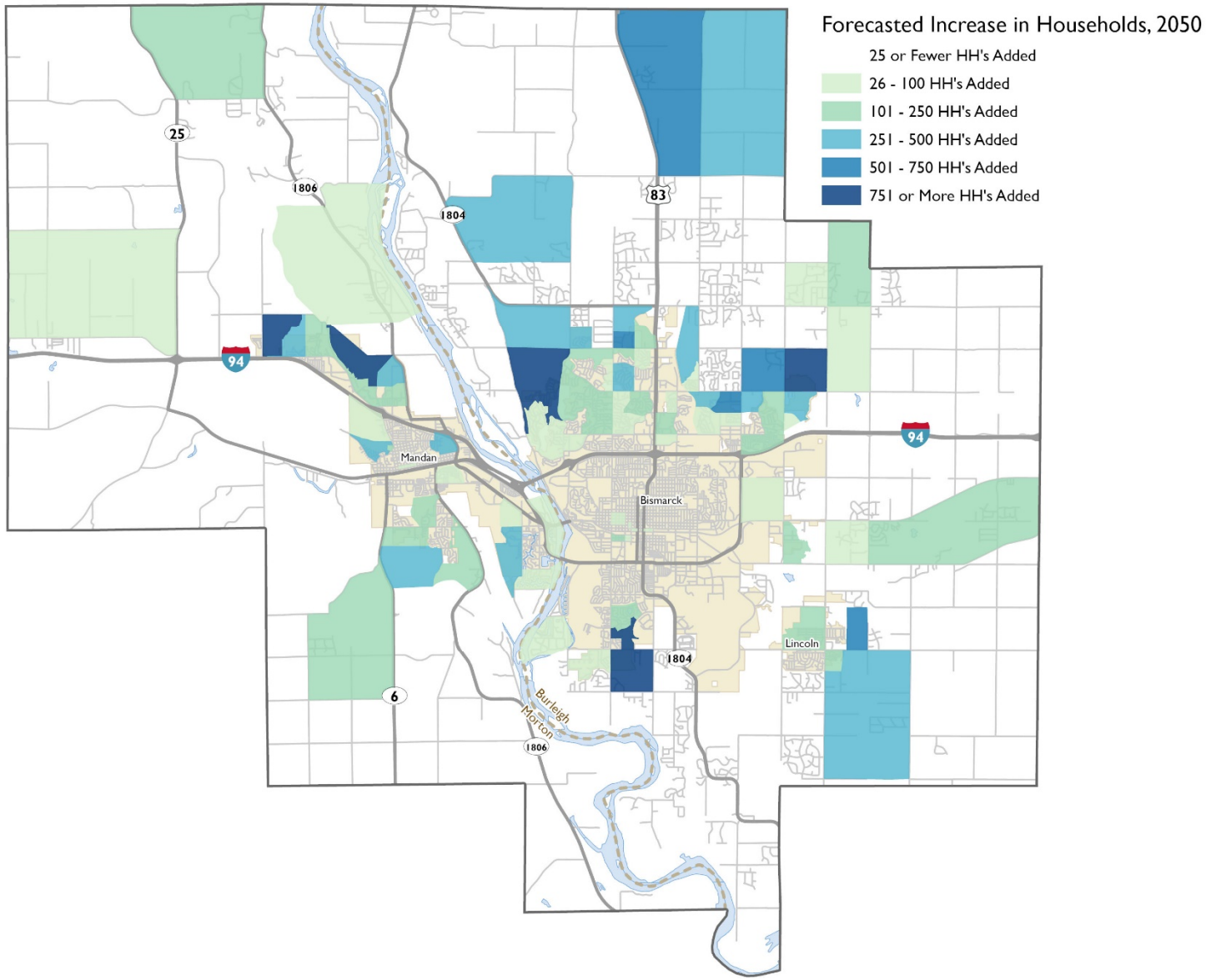
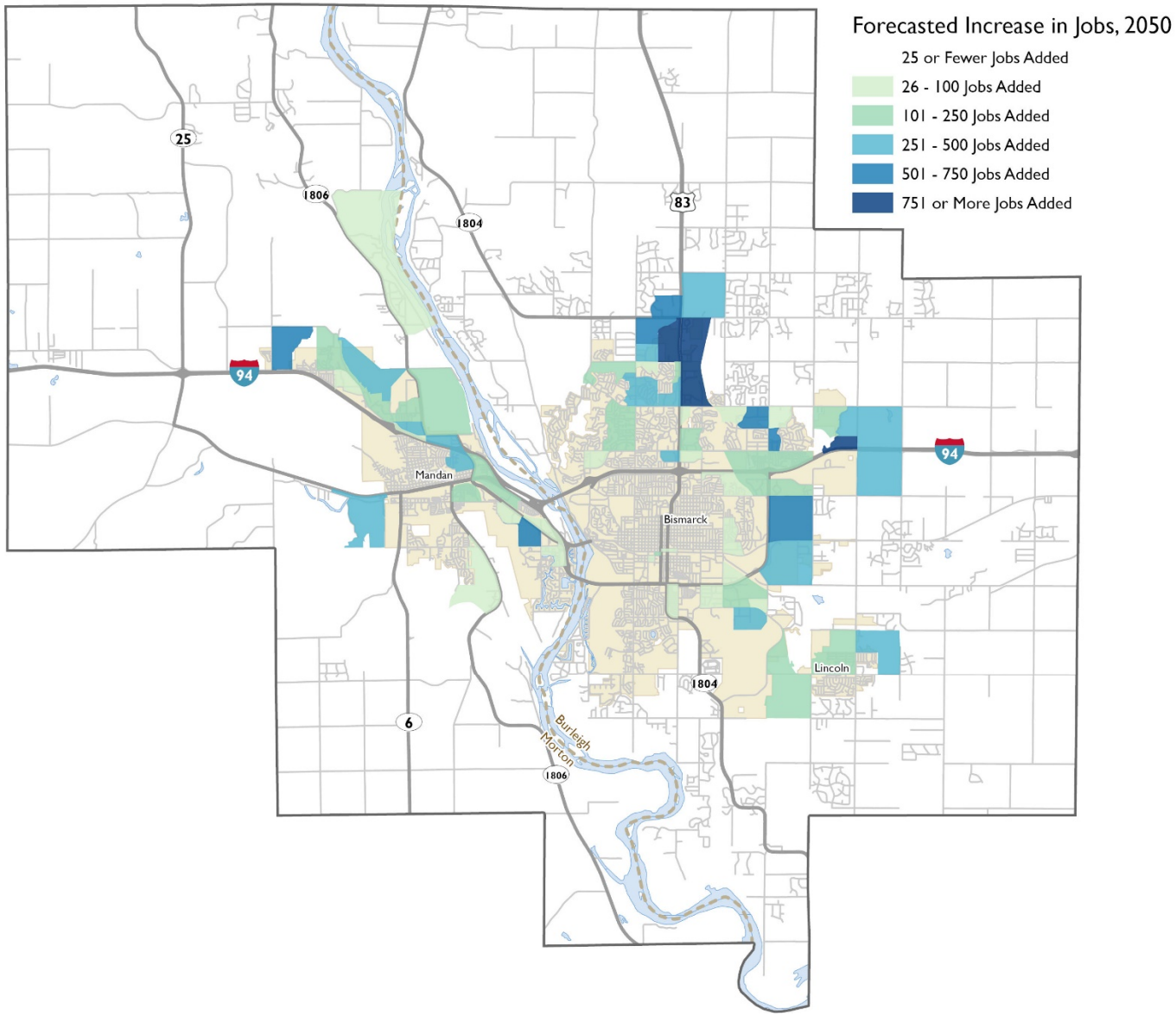


Figure 34: Forecasted Growth in Employment for the Bismarck-Mandan MPO Region, 2021–2050



Future Traffic Operations

Future traffic operations for the Bismarck-Mandan MPO region were evaluated using the updated 2050 TDM network analysis, which forecasts traffic operations under the "existing plus committed" (E+C) or no-build scenario. The base year of the updated TDM is 2021, while 2050 serves as the planning horizon of the model. Using the socioeconomic data and forecasts discussed in the previous section, the TDM disperses daily vehicular traffic across the E+C roadway network that incorporates only improvements to the roadway network that are currently committed for construction. Through understanding how future traffic operates across the current roadway network, potential improvements to the roadway system can be identified while different roadway improvement scenarios can be evaluated against the E+C.

Growth in Daily Traffic Volumes

Forecasted growth in traffic volumes for the MPO region were developed by comparing current year (2021) daily volumes to the forecasted model volumes for the year 2050 and calculating the difference between them. **Figure 35** illustrates how daily traffic volumes are expected to grow in the MPO region through 2050.

Based on the TDM results, the corridors anticipated to see the greatest growth in daily traffic volumes are located on the MPO's arterial network and include US 83/State Street, I-94, ND 1806, N Washington Street, Centennial Road, Bismarck Expressway, and 43rd Avenue NE.

Forecasted Future Year 2050 Traffic Operations

The forecasted traffic volumes resulting from the 2050 E+C TDM scenario were used to develop a future year planning LOS analysis similar to the analysis described in the **Baseline Transportation System Performance** chapter. The resulting planning LOS found the majority of roadways operating at LOS C or worse today are expected to see a decline in future traffic operations because the increase in daily traffic volumes in tandem with existing roadway capacities would result in further degradation of the corridor LOS.

The corridors estimated to see the worst performance in terms of planning LOS under the E+C scenario include the following:

- **US 83/State Street**, from 71st Avenue NE to I-94
- **71st Avenue**, from US 83/State Street to Centennial Road
- **43rd Avenue NE**, from US 83/State Street to 66th Avenue
- **Centennial Road**, from 71st Avenue NE to I-94
- **ND 1806**, from 38th Street to Old Red Trail
- **Old Red Trail**, from ND 1806 to Mandan Avenue

Figure 36 presents the forecasted planning LOS for the MPO region based on the 2050 E+C TDM scenario.

Figure 35: Forecasted Growth in Traffic Volumes, 2021–2050

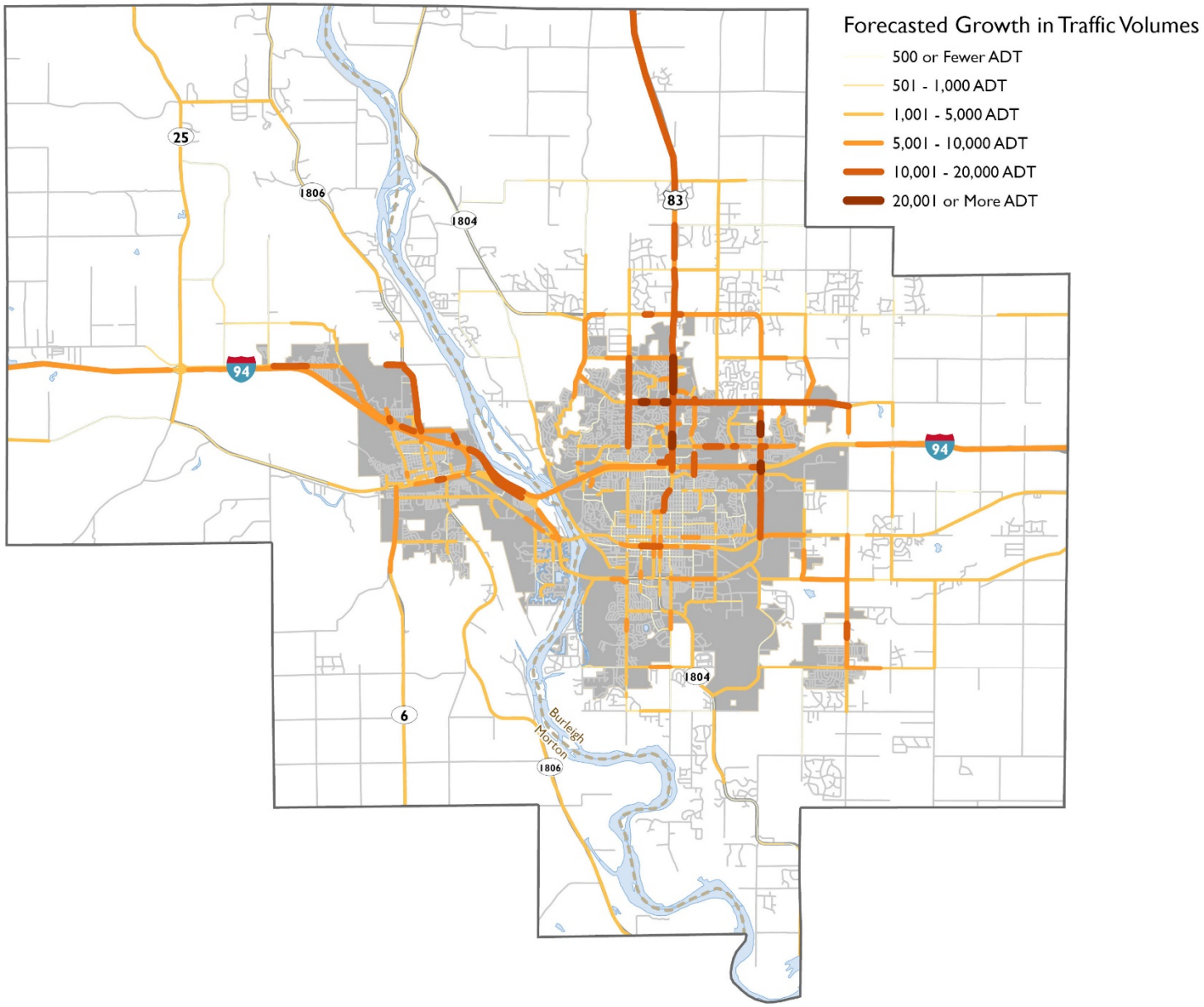
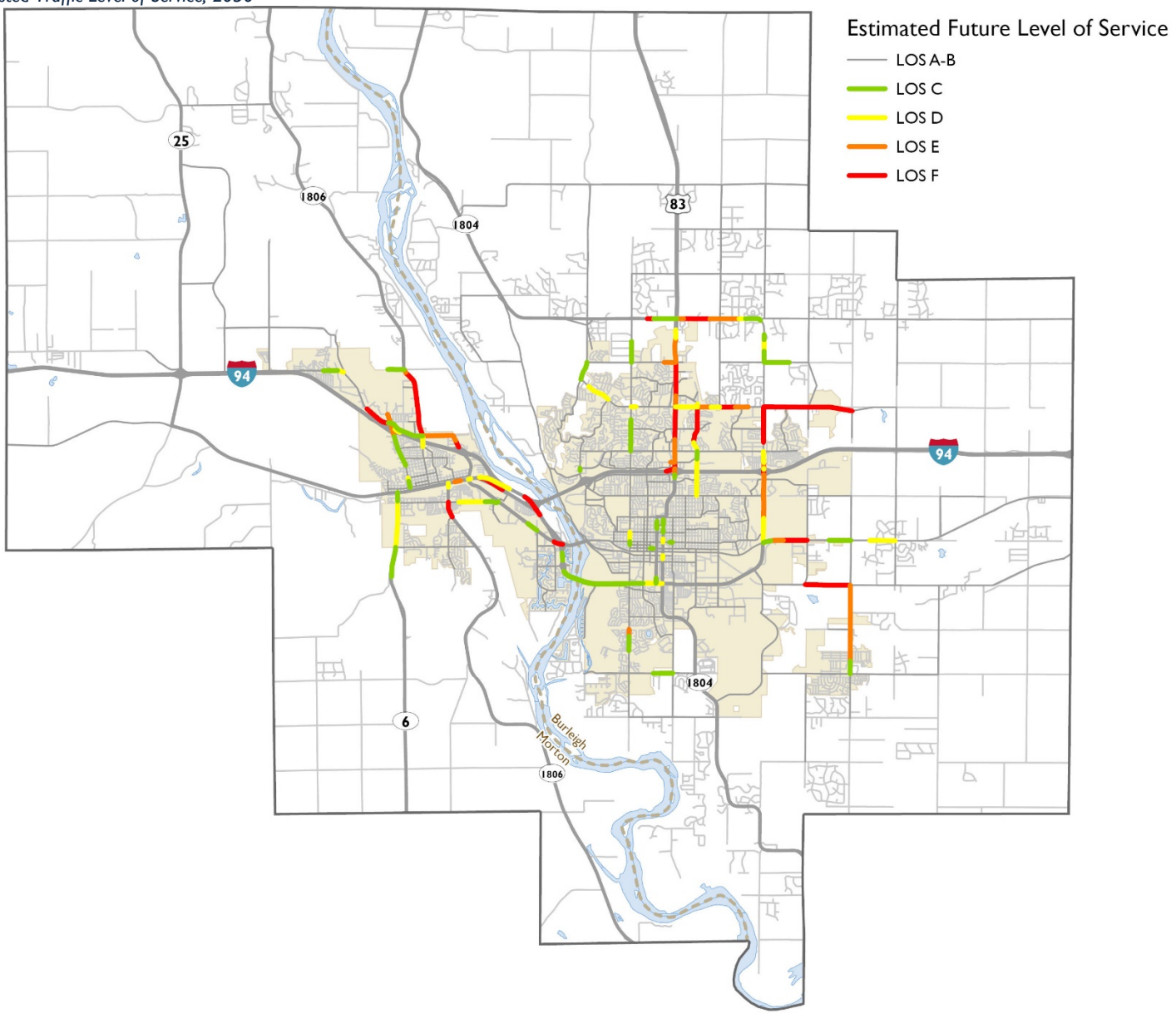


Figure 36: Forecasted Traffic Level of Service, 2050



Forecasted E+C System Performance

System-wide performance of the MPO's roadway network is available in the TDM's 2050 E+C scenario. The key indicators of system-wide performance include the following:

- **Daily Trips:** Number of daily vehicular trips made in the MPO region.
- **Vehicle Miles Traveled:** Total distance traveled by vehicle users in the MPO region. VMT is a function of total trips and each trip's distance.
- **Vehicle Hours Traveled (VHT):** Total time individuals spent traveling in their vehicles during each trip. VHT is a function of the total trips and each trip's time duration.
- **Average Trip Length (miles):** Average length of daily trips taken. Average trip length is the daily VMT divided by total daily trips.
- **Average Travel Speed (miles per hour):** Average speed of all modeled trips. Average travel speed is the daily VMT divided by the daily VHT.

The summary of the 2050 E+C scenario is a nearly 50 percent increase in daily trips due to the increase in population, households, and new jobs in the region, as shown in **Figure 32**. The impact of this forecasted growth with no roadway network improvements beyond those currently programmed is a VMT increase of 60 percent and a VHT increase of 79 percent, meaning that the region's residents and workers will be traveling further each day while spending more time driving. Average daily trip lengths are anticipated to increase by 8 percent, while the average speed at which travelers drive would be expected to decrease by 11 percent.

Daily Trips	Vehicle Miles Traveled	Vehicle Hours Traveled	Average Trip Length (miles)	Average Travel Speed (miles per hour)
48% Increase	60% Increase	79% Increase	8% Increase	11% Decrease

MTP Strategies, Trends, and Drivers

The Bismarck-Mandan MPO is currently facing a series of multimodal transportation issues and anticipates growing issues into the future without system improvements. Compounding these issues would be additional impacts to daily transportation safety and traffic operations owing to continued growth in population, number of households, and employment throughout the region.

Arrive 2050 identifies a series of strategies that are context sensitive and tailored to local conditions. These strategies are discussed in the following sections.

Strategies for the Bismarck-Mandan MPO Region

The overarching approach guiding the development of Arrive 2050's recommended improvements was the application of a strategies toolbox that provided a flexible framework for local jurisdictions to identify transportation improvements as part of a connected and integrated multimodal system. The strategies toolbox also allowed for the matching of strategies so that recommended improvements best fit the context of their associated location.

Strategies Toolbox

The strategies toolbox consists of conventional improvements, such as roadway widenings and expansions, intersection improvements, and installation of turn lanes, while going beyond these approaches to incorporate innovative solutions such as the implementation of ITS technology, innovative intersection designs including roundabouts, and pedestrian crossing treatments such as hardened centerlines. **Figure 37** illustrates a sample of the strategies considered in the development of Arrive 2050 alternatives.

While the strategies toolbox contains a broad range of solutions, the alternatives identified by Arrive 2050 sought fit the local context of the MPO's multimodal transportation system.

Figure 37: Arrive 2050 Strategies Toolbox

Safe Systems Approach

Improving the safety of the multimodal transportation systems has become a top priority for USDOT, and this priority is reflected in USDOT's Safe Systems Approach to improving traffic safety. The Safe Systems Approach is the guiding paradigm used to address and mitigate transportation safety risks.[5] The main goal of the Safe Systems Approach is to is eliminate crashes resulting in fatalities and serious injuries while going beyond just vehicular travel to consider all transportation users.

The principles of the Safe Systems Approach are shown in **Table 21**.

In the Bismarck-Mandan MPO region, a Safe Systems Approach would allow for proactive planning and design of safety solutions for the region's highest-risk locations and prioritizing locations with histories of high numbers of crash events.

Table 21: Principles of the Safe Systems Approach

Death and Serious Injuries are Unacceptable	A Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries.
Humans Make Mistakes	People will inevitably make mistakes and decisions that can lead or contribute to crashes, but the transportation system can be designed and operated to accommodate certain types and levels of human mistakes and avoid death and serious injuries when a crash occurs.
Humans are Vulnerable	Human bodies have physical limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates physical human vulnerabilities.
Responsibility is Shared	All stakeholders, including government at all levels, industry, nonprofit/advocacy groups, researchers, and the public, are vital to preventing fatalities and serious injuries on the roadways.
Safety is Proactive	Proactive tools should be used to identify and address safety issues in the transportation system rather than waiting for crashes to occur and reacting afterwards.
Redundancy is Crucial	Reducing risks requires that all parts of the transportation system be strengthened so that if one part fails, the other parts still protect people.

Source: U.S. Department of Transportation, *What is a Safe Systems Approach?*

[5] U.S. Department of Transportation, *What Is a Safe Systems Approach?*

Improving Safety at Intersections

A major opportunity to improve traffic safety in the MPO region is to address safety at intersections. Several strategies to improve intersection safety are available, and it is crucial to consider the existing intersection design when developing safety solutions. Factors that influence the implementation of intersection safety strategies include crash history, geometric needs, initial and future year cost estimates, current and forecasted traffic volumes, existing and planned density of development, access points in proximity to the intersection location, and current and forecasted bicycle and pedestrian traffic.

Signalized Intersections vs. Roundabouts

One intersection treatment that has been adopted and fits the safety objective of partner jurisdictions is the installation of roundabouts. Several roundabouts have been implemented in the MPO region, and Arrive 2050 recommends considering roundabouts when looking toward intersection improvements.

There are key trade-offs to evaluate when considering toward the installation of signals at an intersection compared to the installation of a roundabout. The pros and cons of roundabouts are summarized in **Figure 38**.

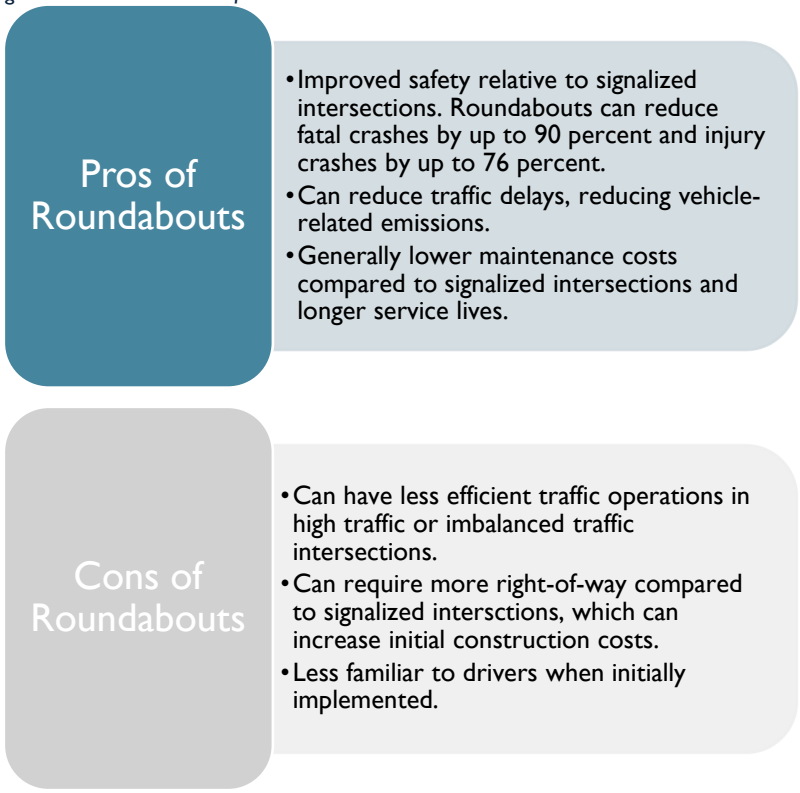
Access Management

Access management is a planning and regulation strategy that manages vehicular access points to development adjacent to streets. This strategy provides a safer, more efficient use of corridors. The tactics that are included in access management include:

- **Access point spacing:** Increased spacing distance between access points improves traffic flow and safety.
- **Median treatments:** Introducing dedicated turn lanes and raised medians to restrict some of the highest-risk left-turn movements can improve traffic flow and safety in a corridor.

Corridors like State Street and Centennial Road can benefit from overlaying an enhanced access management program to restrict future driveway and local street access in growth corridors.

Figure 38: Pros and Cons of Roundabouts



Complete Streets Approach

Complete Streets is an approach to the planning, design, and operation of the street network to improve safe, connected access for all users, including pedestrians, bicyclists, motorists, and transit users. The core tenet of the Complete Streets approach is that roadways are for all users; it does not prioritize vehicular movements at the expense of other modes.

Within the context of Arrive 2050, a context-sensitive Complete Streets lens was applied to developing potential bicycle, pedestrian, and transit improvements along with corridors that were identified for roadway improvements, with the intent of recommending the implementation of bicycle and pedestrian and transit improvements that complement the corresponding street improvement.

Many communities across the United States have formalized the Complete Streets approach to planning and design through the adoption of a Complete Streets policy. Currently, the cities of Bismarck and Mandan have not adopted a Complete Streets policy. However, the Bismarck-Mandan MPO has initiated a Safe Routes to Services and Complete Streets Study that will be completed in December 2024. The study's purpose is to develop a transportation network that emphasizes disadvantaged users while exploring strategies to improve safety, connectivity, and equity. Study recommendations will include policies, transportation services, programs, procedures, and design standards and guidelines.[6]


Example of a Complete Street

Source: Smart Growth America

SAFE ROUTES TO SERVICES

[6] Bismarck-Mandan MPO, *Safe Routes to Services & Complete Street Study.*

Improving the Region's Existing Corridors

Many major corridors in the MPO that are critical to the mobility and connectivity needs of regional travers are currently widened to the extent possible within existing public right-of-way. While a broad range of strategies to improve these mature corridors is available, it is important to evaluate the trade-offs of additional widenings versus implementing corridor management strategies that provide lower-impact safety and mobility improvements. Examples of these improvements include intersection geometry upgrades, adjustments to intersection controls such as signals or roundabouts, and retiming of traffic signals across a corridor to improve traffic operations and safety.

The deployment of corridor management strategies can avoid the potential impacts on right-of-way and adjacent properties, induced travel, environmental impacts, and higher costs associated with widenings.

Addressing Cross-Area Travel

The need to improve cross-area travel in the MPO region has been documented throughout multiple metropolitan transportation plans, with the issue of north-south mobility predominantly affecting Bismarck and east-west mobility predominantly affecting Mandan. Arrive 2050 looks to address these issues through developing alternatives that provide new connections and set the stage for the development of future corridors that can facilitate the needed mobility.

The strategies from the toolbox to address cross-area travel identified include:

- **New corridors and existing corridor improvements**
- **Access management**
- **Intersections**

Pavement Management Strategies

The State of the Streets report found that maintenance and reconditioning treatments (e.g., crack sealing, seal coats, patching) were incorrectly applied as "stopgap" or "cosmetic" treatments for pavements in poor condition rather than as true preservation activities. The appropriate preventive maintenance treatments should be applied to pavements that are in relatively good condition to increase the extent of the pavement service. This activity should be planned and applied systemically following either the resurfacing or reconstruction of pavement, as shown in **Figure 39**.

The recommended findings from the State of the Streets report were based on an annual pavement deterioration rate from historical work records entered in PAVER and PCI inspection data. The MPO estimated that the pavement deterioration rate for asphalt roadways is roughly 2 points per year, equating to a pavement life between major rehabilitations of approximately 17.5 years. A deterioration rate of roughly 1 point per year was used for the concrete roadways, which equated to a pavement life between major rehabilitations of approximately 25 years.

Considerations for Pavement Preservation Prioritization

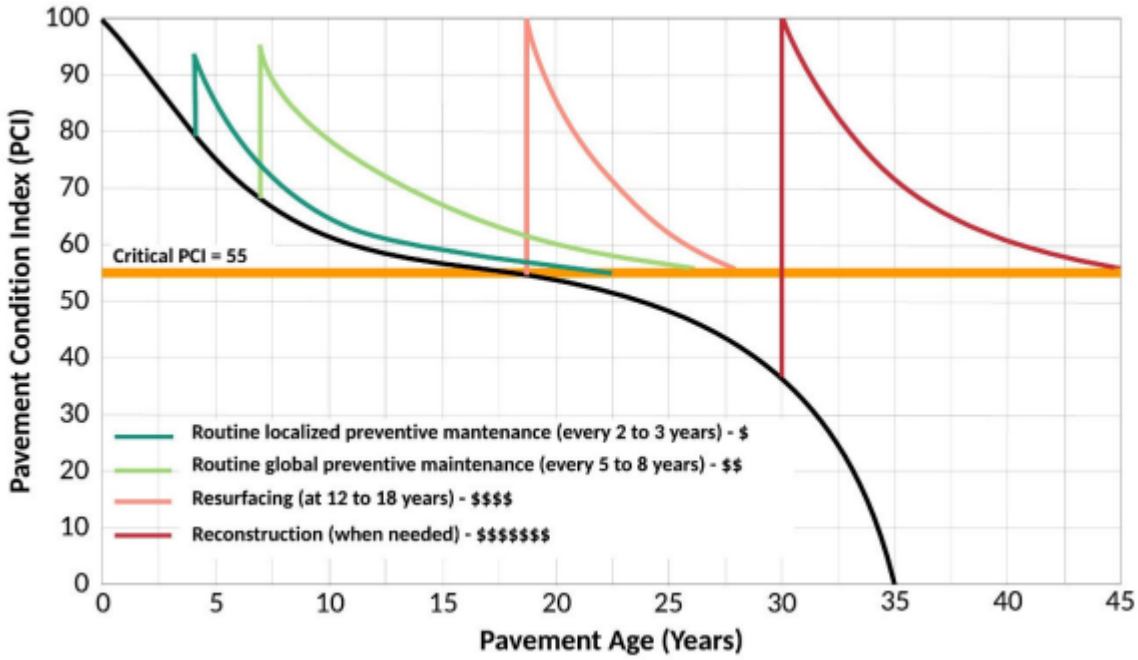
The overall strategies proving to be most cost efficient and effective in the long-term for pavement management include:

- Preventing "fair condition" roads from falling into "poor condition;" avoid worst-to-first approach,
- Prioritizing maintenance and rehabilitation projects on good and fair condition pavements over poor condition pavements,
- Prioritizing timely preservation strategies over more expensive reconstruction fixes,
- Identifying the appropriate life cycle time frame for the roadway system,
- Prioritizing reclamation projects over reconstruction,

- Prioritizing projects on poor condition pavements only as revenues allow and only on pavement that has another factor or circumstance to address at the time of reconstruction/ reclamation (i.e., roadway with poor pavement condition AND operational, safety, freight, and/or other challenges),
- Prioritizing maintenance and rehabilitation projects that forward the goals and objectives of the MTP.

Before a list of maintenance or pavement management projects is developed, the MPO and partner jurisdictions should consider prioritization and policy strategies and which types of activities and locations are best suited for future available federal revenue.

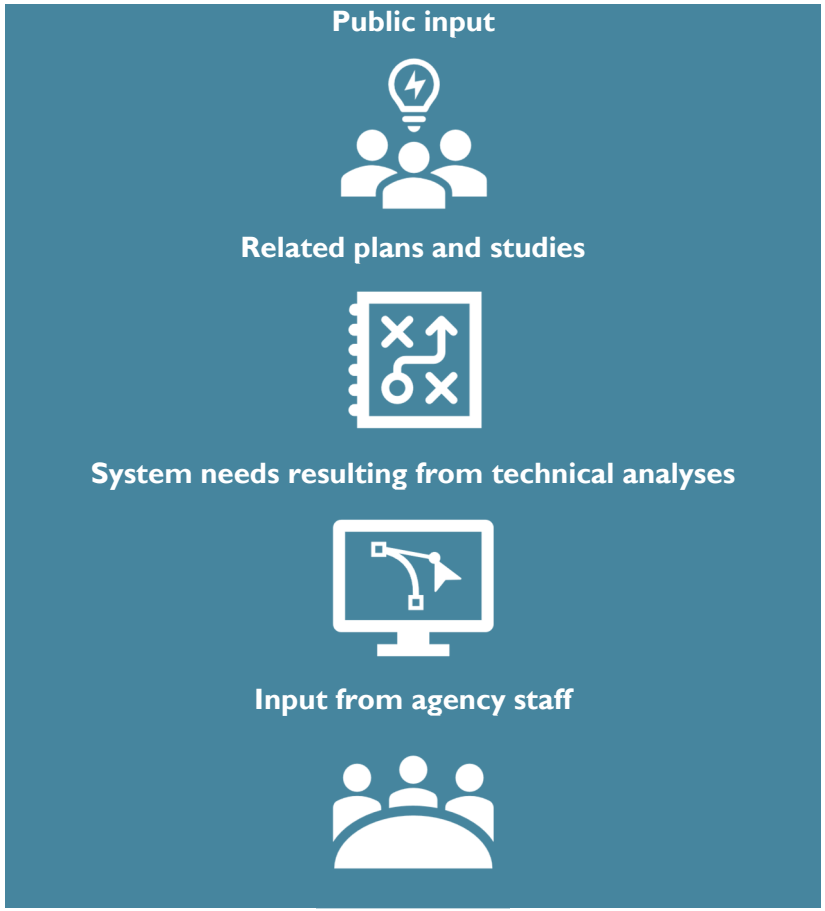
Figure 39: Example of the Increasing Prices and Decreases Benefits of Maintenance and Reconditioning



Source: Bismarck-Mandan MPO, *2020 State of the Streets*

Development of Arrive 2050 Alternatives

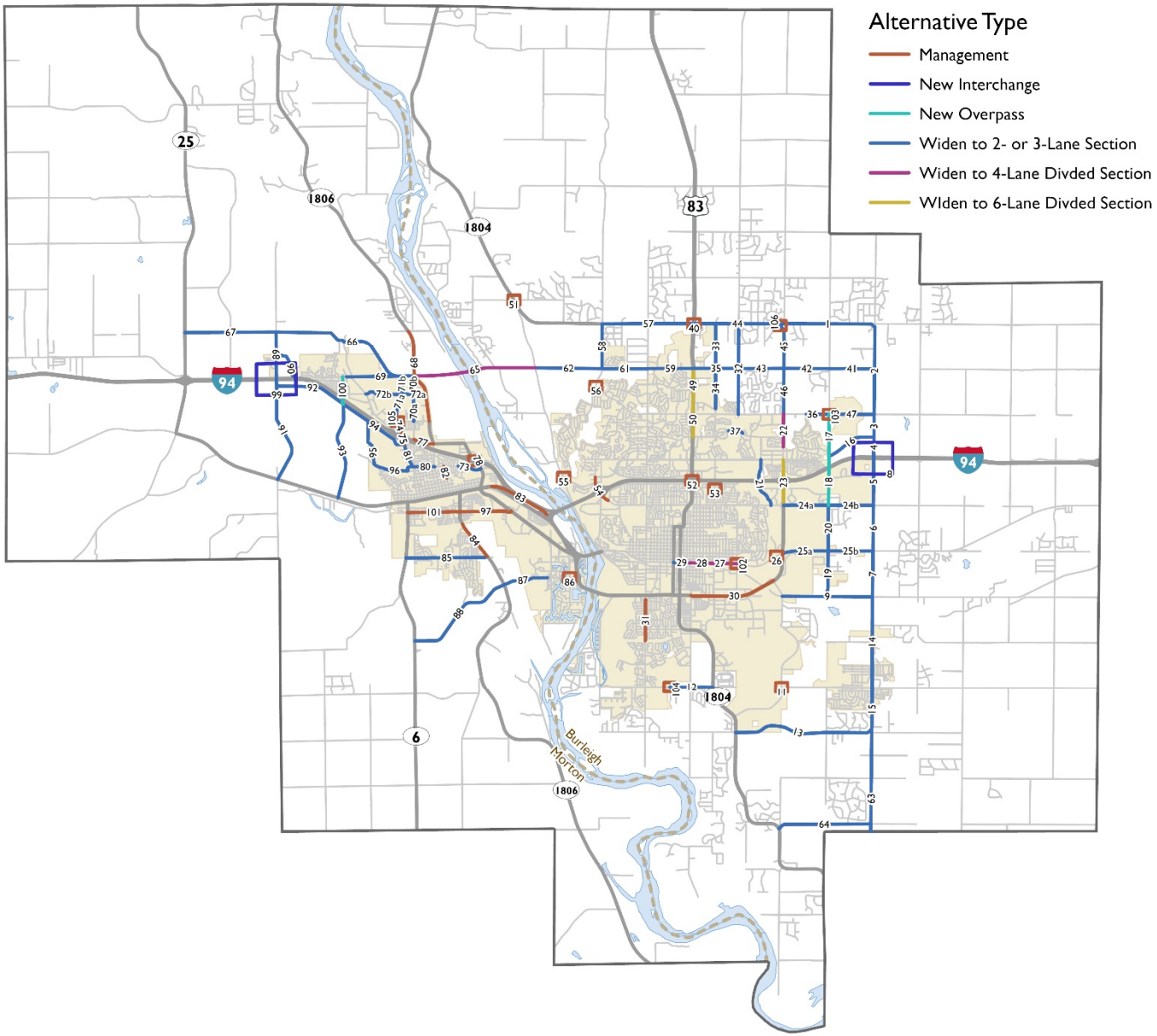
The range of alternatives for Arrive 2050 was developed through a collaborative process that integrated the following:



Based on the alternatives, those that best meet the MPO's priority areas were selected for inclusion in the Fiscally Constrained Plan.

Figure 40 shows Arrive 2050's alternatives, while **Appendix D** includes a table detailing each one. Alternatives shown in **Figure 40** are labeled with an ID that corresponds to the alternative's listing in the table found in **Appendix D**.

Figure 40: Arrive 2050 Alternatives



Alternatives Benefiting Cross-Area Travel

Many issues facing cross-area travel are due to relatively high traffic volumes in key corridors. When evaluating the range of potential alternatives shown in **Figure 40** with the MPO's TDM, there were two projects that provided the most notable benefits to cross-area travel:

- **Northern Bridge Crossing (ID #65):** Including this alternative in the TDM had a significant impact diverting traffic from State Street/ US 83 (approximately 3,000 vehicles per day to 10,000 vehicles per day) and I-94/Grant Marsh Bridge (approximately 13,000 vehicles per day)
- **McKenzie Drive Extension (ID #87 and #88):** Including the extension of McKenzie Drive between 34th Ave SE and Hwy 1806 across the Heart River would divert approximately 10,000 vehicles per day from Memorial Highway and approximately 7,000 vehicles per day from 3rd Street South.

Trends and Drivers

In the past decade, the rapid advancement of transportation technologies and mobility trends has changed the way transportation systems operate. These trends were analyzed to better understand how the Bismarck-Mandan MPO's multimodal transportation network may evolve over the Arrive 2050 planning horizon based on how users are expected to travel in the future and factors influencing travel outside the region. Trends and drivers impacting transportation in the Bismarck-Mandan region and those impacting transportation outside the region are listed below.

Bismarck-Mandan MPO region trends:

- Household growth
- Drafting demographics
- Economic growth
- Development patterns

Broader trends:

- Technology
- Federal policies and funding
- Safety trends
- Changing travel patterns
- Climate change

These factors influence how transportation systems operate; understanding how they are changing can help prepare for future transportation systems. As transportation industry technology continues to evolve rapidly, so do federal policies and funding. The federal transportation bill passed in 2021, the Infrastructure Investment and Jobs Act, has created significant funding aimed to modernize and improve transportation infrastructure nationwide. A more full summary of the trends and divers is provided in **Appendix F**.

Arrive 2050 Funding Plan

This chapter provides a summary of the funding plan developed as part of the Arrive 2050 planning process. The funding plan details analyses related to the following:

- **Current funding programs**
- **Historic revenue levels by program**
- **Forecasted revenue levels that can reasonably be expected through the year 2050**

These analyses provide a baseline funding plan to support the development of Arrive 2050's Fiscally Constrained Plan. Refer to **Appendix E** for Arrive 2050's detailed Funding Plan.

Financial Plan in the MTP

Federal metropolitan transportation planning requirements articulated in 23 CFR 450.324 require that an MPO's MTP contain a financial plan that demonstrates how the MTP can be implemented based on an understanding of the reasonable transportation funding levels expected through the life of the plan.[7] These regulations also require a demonstration of fiscal constraint and the ability of the MPO to adequately operate and maintain the federal-aid transportation system. This section of the report will discuss the current funding programs providing transportation revenues to the Bismarck-Mandan MPO and sources of local revenues used for transportation purposes.

Relevant Funding Programs

The following funding programs comprise the key sources of transportation revenues for the Bismarck-Mandan MPO's partner agencies. The funding sources direct federal transportation dollars (not including local matching funds), with NDDOT leading the program administration.

NDDOT allocates federal transportation funds to the state's MPOs for use on federally eligible transportation projects.

Interstate Program

The Interstate Program directs NDDOT funding toward improvements and modifications to mainline Intestate segments or existing and new interchanges needed to alleviate congestion due to mainline traffic.[8] While NDDOT is responsible for funding interstate improvements, local public agencies (LPAs) are required to fund grade-separated non-interchange roads and interchange projects stemming from cross-road traffic.[9]

Under the Interstate Program, NDDOT provides the match for federal funds, which is 10 percent for improvements that do not add capacity and 19.07 percent for improvements that add capacity.

National Highway Performance Program

The National Highway Performance Program (NHPP) provides funding for projects that support the condition and performance of the state's Intestate NHS and non-Interstate NHS routes, including new NHS facilities that further the state's progress toward performance measure targets. NDDOT directs NHPP funding allocated to the MPO region, who does not annually solicit these funds. NDDOT continues to program projects under an Interstate or IM category. It is noted that this is a project category and does not constitute a separate funding program.

[7] 23 CFR Part 450.
[8] North Dakota Department of Transportation, *Local Government Manual*
[9] Ibid.

Urban and Regional Programs

Urban Roads Program

Urban roads refers to roadways owned by LPAs that are located on the federal aid system. Funding provided to the MPO under the Urban Roads program is distributed through the Urban Roads formula and is based on annual funding available in the program. LPAs are responsible for the prioritization of improvements within their jurisdictions.

Urban Roads funds are calculated based on each LPA's proportion of population compared to the state's total urban population per the most recent decennial census plus a base amount. Eligible project types that can receive federal funds under the Urban Roads program include preliminary engineering (PE), construction engineering (CE), right-of-way acquisition, utility relocation, and construction. Each LPA is responsible for providing the local match for federal funds, which is 19.07 percent of total project cost.

Urban Regional Roads Program

Urban regional roads are defined as state highways that run through cities with populations of 5,000 or more. NDDOT coordinates annually with eligible LPAs to program projects based on available Urban Regional Roads funding. NDDOT annually solicits for projects that qualify under this program and distributes funds based on needs.

Activities eligible for Urban Regional Roads funds include PE, CE, right-of-way acquisition, utility relocations, and construction. The Urban Regional Road Program consists of two sub-programs that determine local match requirements:[10]

- **Primary Regional Program:** The match for federal funds is provided by NDDOT (19.07 percent), except for service road improvements and items not eligible for federal aid. In these instances, the LPA is responsible for providing a local match, or 100% of funding.
- **Secondary Regional Program:** The match for federal funds is provided by NDDOT (9.07 percent) and the LPA (10 percent), except for service road improvements and items not eligible for federal aid. In these instances, the LPA is responsible for providing the local match, or 100% of funding.

Safety Program

NDDOT's Safety Program allocates funding from the federal Highway Safety Improvement Program (HSIP) that are to be used on safety projects. NDDOT allocates these funds to projects that reduce fatal and serious injury crashes. Projects funded under the Safety Program are selected based on NDDOT's annual list of high-crash locations and local safety needs submitted by LPAs. Based on the LPA's safety needs, eligibility criteria, and available HSIP funds, NDDOT develops its safety program for the next 4 years; projects located in MPO boundaries require LPAs to go through the MPO prioritization process.[11]

Eligible activities under the Safety Program include PE, CE, right-of-way acquisition, utility relocations, and construction for projects located on the state highway system; CE and construction are the only activities eligible for safety funds for projects located on the LPA roads system. Federal funds provide 90 percent of funding for safety projects, and the 10 percent match is provided by either NDDOT or NDDOT and the LPA, depending on the project location. If the improvement is on the Secondary Regional System, the 10% match could be 5% state and 5% LPA.

[10] North Dakota Department of Transportation, *Local Government Manual*

[11] Ibid.

Transportation Alternatives Program

The Transportation Alternatives (TA) Program provides funding for programs and projects defined as transportation alternatives, including bicycle and pedestrian facilities, Safe Routes to School projects, safe routes for non-drivers, community improvement activities, and environmental mitigation projects.[12] TA funds are distributed on a discretionary basis, with projects selected by NDDOT's TA project selection committee.

Construction is the only activity eligible for funding under the TA Program. PE, CE, environmental impact mitigation, right-of-way acquisition, and utility relocations are not eligible for TA funding and are the responsibility of the LPA. Federal funds allocated under the TA Program cover 80.93 percent of total project costs, and the LPA is responsible for a 19.07 percent local match.

Additional Federal and State Sources of Transportation Funds

The programs described above provide the majority of annual transportation funds for the MPO region. However, NDDOT administers several additional programs that aid the MPO in funding regional transportation improvements. These programs include:

- **Flexible Transportation Fund Program (Flex Fund):** Established by the 68th Legislative Assembly in 2023, the Flex Fund Program provides LPAs with funding for projects that meet or advance economic development, safety, complete streets, multimodal system, roadway restriction (height or weight limitations), and innovation goals. Funds are allocated on a discretionary basis and awarded through the state's Flex Fund committee.
- **Urban Grant Program (UGP):** This program distributes approximately $4.6 million each year to North Dakota cities with populations of 5,000 or more. These funds are used for improvements on federal aid roadways in urbanized areas and are intended to improve bicycle, pedestrian, or other multimodal facilities that enhance downtown areas.
- **Recreational Trails Program (RTP):** This program is a discretionary grant program that provides funding for motorized and non-motorized recreational trail projects. It is administered at the state level by the North Dakota Parks and Recreation Department and federally through the FHWA. Grant awards range from a minimum of $30,000 to a maximum of $250,000 and require a 20 percent local match.[13]

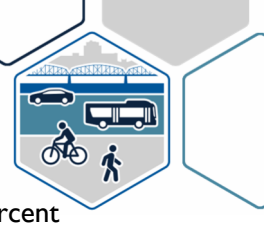
Recent Federal Funding Programs

The Bipartisan Infrastructure Law, signed into legislation as the Infrastructure Investment and Jobs Act, introduced new formula and discretionary transportation grant programs that address the areas of safety, modernization, climate, and equity. In the MPO region, several formula funding programs authorized through IIJA are incorporated into existing programs such as the Urban Roads Program. These programs include:

- **Carbon Reduction Program (CRP):** This program provides funding for projects that reduce carbon dioxide emissions from on-road highway sources.
- **Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT):** This program provides funding to increase the resiliency of surface transportation to natural hazards.
- **National Electric Vehicle Infrastructure Formula Program (NEVI):** This program provides funding to states for the strategic deployment of electric vehicle charging infrastructure.

[12] North Dakota Department of Transportation, *Transportation Alternatives*

[13] North Dakota Parks and Recreation, *Recreational Trails Program*



Local Funding Programs

The LPAs in the MPO region have local funding programs that are used to supplement the MPO funding programs discussed above and provide funding for transportation improvements that do not receive federal funding assistance. Major local funding programs for the Bismarck and Mandan, as well as Burleigh and Morton Counties, are discussed below.

City of Bismarck

Local funding programs that Bismarck uses for transportation improvements include the following:[14]

- **Special Assessments Fund:** Funds received from the city's special assessments
- **Sales Tax Fund:** Special revenues collected from the city's self-imposed 1.5 percent sales tax revenue for voter-approved eligible expenditures
- **Special Deficiency Fund:** Funds made up of transfers from the city's general fund to supplement special assessment revenues and bridge gaps in funding for capital projects
- **Street Light Utility Fund:** Accounts for the cost of providing electricity and maintenance of the city's residential street lights and traffic signals

City of Mandan

Local funding programs that Mandan uses for transportation improvements include the following:[15]

- **Highway Distribution Fund:** Money distributed by the state treasurer and allocated to incorporated cities
- **Special Assessments Fund:** Funds received from special assessments, which include sidewalks, curbs, gutters, and streets
- **1 Percent City Sales Tax Fund:** Accounts for the 1 percent city sales and use tax for reducing property taxes and municipal debt; street, water, and sewer system improvements; and jobs and economic development
- **Street Light Utility Fund:** Accounts for the activities of the city's street lighting system operations

Burleigh County

Local funding programs that Burleigh County uses for transportation improvements include the following:[16]

- **County Road and Bridge Fund:** Revenues made available from NDDOT to assist North Dakota counties in implementing projects on federal aid routes that are owned by the respective county. Funding for bridges more than equal to or greater than 20 feet in span is also available to North Dakota counties for replacement or rehabilitation projects.
- **Highway Tax Distribution:** Money distributed by the state treasurer and allocated to North Dakota's counties.

Morton County

Local funding programs that Morton County uses for transportation improvements include the following:[17]

- **County Road and Bridge Fund:** Revenues made available from NDDOT to assist North Dakota counties in implementing projects on federal aid routes that are owned by the respective county. Funding for bridges more than equal to or greater than 20 feet in span is also available to North Dakota counties for replacement or rehabilitation projects.
- **Unorganized Road Fund:** Funding for roadway improvements on roads in unorganized townships.

[14] City of Bismarck, *Annual Budget Fiscal Year 2024*
[15] City of Mandan, *Budget*
[16] Burleigh County, *Budget of Burleigh County, North Dakota, 2024*
[17] Morton County, *Morton County 2023 Budget Revenue YTD*

- **Highway Distribution Tax Fund:** Money distributed by the state treasurer and allocated to North Dakota's counties.

Historic Revenue Levels

MPO Programs

Historic revenues levels received by the MPO for the years 2017–2024 were analyzed based on historic TIP documents for this period. Based on the analysis of these documents, baseline revenue levels for the MPO's key funding programs were identified and then used to forecast reasonably expected revenues through the year 2050. These forecasted revenues comprise Arrive 2050's fiscally constrained plan.

Table 22 summarizes the historic revenues for the Urban Roads, Urban Regional Roads, Interstate, NHPP, Safety, Urban Grant, and TA Programs on an annual basis and provides total and average revenue levels received between 2017 and 2024.

Historic Urban Roads Revenues

Urban Roads revenues received by the MPO between 2017 and 2024 were reviewed based on the agency's funding amounts granted through the Obligation Authority, which totaled a little more than $33 million and averaged nearly $4.2 million per year during this period.

Historic Urban Regional Roads Revenues

Urban Regional Roads revenues received by the MPO between 2017 and 2024 totaled roughly $158 million and averaged $19.8 million per year during this period. Similar to the Urban Roads Program, Urban Regional Roads revenues saw substantial fluctuations on a year-to-year basis owing to high dollar projects programmed the years 2023 and 2024, which resulted in a high historic total and average annual revenue level.

Historic Interstate Revenues

Interstate revenues received by the MPO between 2017 and 2024 total $94.3 million and averaged $11.8 million per year. Several years saw higher revenue levels due to the programming of higher-cost projects in 2019, 2023, and 2024.

Historic Safety Revenues

Safety revenues received by the MPO between 2017 and 2024 totaled nearly $20.8 million and averaged $2.6 million per year.

Historic TA Revenues

TA revenues received by the MPO between 2017 and 2024 totaled $3.5 million and averaged a little less than $432,000 per year. The trend in historic TA revenues received on an annual basis was stable, with only the year 2022 seeing a higher-than-normal receipt of TA funds.

Historic Urban Grant Revenues

Urban Grant revenues received by the MPO between 2017 and 2024 totaled $6.7 million and averaged roughly $842,000 per year during this time. Given the discretionary nature of this funding source, the MPO does not anticipate receiving Urban Grant funding each year.

Table 22: Historic MPO Funding Revenues

Program	2017	2018*	2019	2020	2021	2022	2023	2024	Total	Average
Urban Roads	$3,692,312	$3,756,158	$3,926,416	$4,370,382	$4,470,216	$4,248,520	$4,404,943	$4,499,223	$33,368,170	$4,171,021
Urban Regional Roads**	$451,000	$0	$5,117,378	$12,302,000	$13,696,808	$14,386,859	$72,939,612	$39,140,876	$158,034,533	$19,754,317
Interstate	$8,708,196	$7,410,545	$15,602,600	$0	$9,959,851	$3,000,000	$19,416,231	$30,248,768	$94,346,191	$11,793,274
Safety	$580,000	$0	$3,782,000	$0	$6,599,820	$7,063,473	$2,593,104	$140,000	$20,758,397	$2,594,800
TA	$206,000	$0	$412,110	$0	$639,000	$1,210,879	$473,000	$514,499	$3,455,488	$431,936
Urban Grant	$0	$0	$1,976,099	$0	$0	$2,851,000	$1,912,000	$0	$6,739,099	$842,387

Source: Bismarck-Mandan MPO, *2017–2024 Transportation Improvement Programs*

*The MPO did not publish a TIP in 2018, so these values represent funds programmed in 2018 that were provided in the 2017 TIP publication.

**Urban Regional Roads totals may include a portion of NHPP revenues.

Local Programs

Historic revenues received by the LPA's in the MPO region, including the cities of Bismarck and Mandan and Burleigh and Morton Counties, were analyzed based on historic agency budgets and capital improvement programs. Based on the historic revenue levels identified in these documents, baseline revenue levels for the LPA's key funding programs were identified and then used to forecast reasonably expected revenues through the year 2050. These forecasted revenues comprise fiscally constrained revenue levels for the LPAs.

City of Bismarck

Revenues received by Bismarck were identified based on capital improvement program information for transportation improvements between 2017 and 2024 for the city's Special Assessments, Sales Tax, Special Deficiency, and Street Light Utility funds. A summary of historic revenues received for each fund is shown in **Table 23**.

As **Table 23** shows, revenues received by Bismarck for the Special Assessments fund totaled more than $121 million between 2017 and 2024, averaging $15.1 million per year. Revenues received for the Sales Tax fund total $109.6 million during this period and averaged $13.7 million per year, while revenues received for the Special Deficiency fund total $18.1 million, at an average of $2.2 million per year between 2017 and 2024. Street Light Utility fund revenues amounted to $6.4 million and averaged a little less than $1.1 million per year.

City of Mandan

Revenues received by Mandan were identified based on the city's annual budget documents for the years 2022–2024. Sources of transportation-related revenues for Mandan include the Highway Distribution fund, Special Assessments fund, 1 Percent City Sales Tax fund, and the Street Light Utility fund. **Table 24** shows historic revenues received for these funds between 2022 and 2024.

As **Table 24** shows, Mandan received a little less than $3.4 million in Highway Distribution funds between 2022 and 2024, averaging $1.1 million per year. Revenues received for the Special Assessments fund totaled $12.1 million at an average of $4 million per year, while 1 Percent City Sales Tax revenues equaled roughly $9.6 million and averaged $3.2 million per year. Street Light Utility fund revenues received between 2022 and 2024 totaled $1.4 million at an average of $470,000 per year.

Burleigh County

Revenues received by Burleigh County were identified based on the county's historic budgets for the years 2018 and 2024, which identify revenue levels for the county's County Road and Bridge fund and Highway Tax Distribution fund. A summary of historic revenues received for each fund is shown in **Table 25**.

As **Table 25** shows, revenues for the County Road and Bridge fund totaled $91.1 million between 2018 and 2024, with annual revenues averaging a little more than $13 million. Highway Tax Distribution fund revenues totaled $48.7 million at an average of a little less than $7 million per year.

Morton County

Revenues received by Morton County were identified based on historic county budget documents for the years 2015–2023, which provide historic annual revenues for the county's County Road and Bridge fund, Unorganized Road fund, and Highway Distribution Tax fund. **Table 26** summarizes historic revenues by program for Morton County.

As **Table 26** shows, Morton County received $21.3 million in County Road and Bridge funds between 2015 and 2023, with revenues for this program averaging $2.4 million annually.

Unorganized Road fund revenues amounted to $8.5 million, with an average of $944,000 per year, while Highway Distribution Tax fund revenues equaled $48.2 million, or $5.4 million per year.

Table 23: City of Bismarck

Program	2017	2018	2019	2020	2021	2022	2023	2024	Total	Average
Special Assessments Fund	$11,797,921	$9,104,475	$10,715,550	$13,797,536	$23,763,773	$20,885,274	$16,531,628	$14,533,000	$121,129,158	$15,141,000
Sales Tax Fund	$0	$0	$5,199,989	$17,101,356	$6,341,044	$46,196,396	$9,976,606	$24,808,000	$109,623,390	$13,703,000
Special Deficiency Fund	$8,435,772	$4,888,611	$90,213	$888,363	$839,059	$0	$274,041	$2,680,000	$18,096,059	$2,262,000
Street Light Utility Fund	$0	$0	$565,345	$676,665	$728,111	$977,956	$1,291,216	$2,116,045	$6,355,338	$1,059,000

Source: City of Bismarck Capital Improvement Program Summaries

Table 24: City of Mandan

Program	2022	2023	2024	Total	Average
Highway Distribution Fund	$1,094,864	$1,094,864	$1,178,110	$3,367,838	$1,123,000
Special Assessments Fund	$4,261,135	$4,261,135	$3,586,239	$12,108,509	$4,036,000
1 Percent City Sales Tax Fund	$3,172,347	$3,172,347	$3,232,482	$9,577,176	$3,192,000
Street Light Utility Fund	$472,502	$466,090	$472,589	$1,411,181	$470,000

Source: City of Mandan

Table 25: Burleigh County

Program	2018	2019	2020	2021	2022	2023	2024	Total	Average
County Road and Bridge Fund	$15,482,793	$16,821,945	$10,733,765	$9,498,849	$9,645,164	$14,771,527	$14,189,672	$91,143,715	$13,021,000
Highway Distribution Tax Fund	$6,502,000	$7,215,000	$7,211,000	$6,033,164	$6,621,622	$8,200,000	$6,950,000	$48,732,786	$6,962,000

Source: Burleigh County

Table 26: Morton County

Program	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	Average
County Road and Bridge Fund	$6,437,37	$7,721,543	$1,061,467	$1,180,120	$746,557	$1,070,958	$1,046,980	$1,006,461	$1,039,817	$21,311,275	$2,368,000
Unorganized Road Fund	$1,039,39	$786,590	$787,368	$845,433	$909,682	$947,699	$1,401,686	$884,861	$888,815	$8,491,530	$944,000
Highway Distribution Tax Fund	$2,960,00	$2,488,185	$26,190,00	$2,769,582	$2,779,234	$2,523,613	$2,596,289	$2,628,000	$3,271,837	$48,206,740	$5,356,000

Source: Morton County

Future Forecasted Revenue Levels

Federal metropolitan transportation planning regulations require the MTP to include an estimate of future revenues that the MPO may reasonably expect to receive over the life of the plan. Based on the historic revenue levels and input from MPO staff, future revenue levels were forecasted to reasonably estimate the level of transportation revenues the MPO may receive through 2050.

Baseline Revenue Levels for MPO Programs

Baseline revenue levels are the basis for forecasting future revenue for programs detailed in **Table 27**.

Table 27: Estimated Baseline Annual Revenue Levels by MPO Program

Program	Baseline Revenue Level
Urban Roads[18]	$5,339,971
Safety (State)	$1,540,000
Safety (Urban)	$1,430,000
TA	$361,452
Urban Grant	$580,000

Note that several programs such as the Interstate/NHPP and Urban Regional program are not included in the future forecasted revenues because they are state discretionary programs directed at the state system. NDDOT looks at needs across the entire state system when allocating these monies, and thus cannot be effectively forecasted on a regional basis.

Baseline Revenue Levels for Local Programs

Baseline revenue levels used to forecast local funds were developed based on the historic revenue levels discussed in the preceding section. The historic revenue level for each LPA funding program was averaged, and the average amount constituted the baseline revenue level used to forecast funding through 2050. **Table 28** presents the baseline revenue level for each city's funding program. The baseline level used for forecasting future revenues for Burleigh and Morton Counties is shown in **Table 29**.

[18] Urban Roads baseline levels were established based on 2023 allocated levels. Future levels are not guaranteed and may vary.

Table 28: Baseline Annual Revenues for the Cities of Bismarck and Mandan

Program	Baseline Revenue Level
City of Bismarck	
Special Assessments Fund	$15,141,000
Sales Tax Fund	$13,703,000
Special Deficiency Fund	$2,262,000
Street Light Utility Fund	$1,059,000
City of Mandan	
Highway Distribution Fund	$1,123,000
Special Assessments Fund	$4,036,000
1 Percent City Sales Tax Fund	$3,192,000
Street Light Utility Fund	$470,000

Table 29: Baseline Annual Revenues for Burleigh and Morton Counties

Program	Baseline Revenue Level
Burleigh County	
County Road and Bridge Fund	$13,021,000
Highway Distribution Tax	$6,962,000
Morton County	
County Road and Bridge Fund	$2,415,000
Unorganized Road Fund	$963,000
Highway Distribution Tax Fund	$5,463,000

Revenue Forecast Growth Rates

To forecast future revenues for the MPO's key funding programs a conservative annual growth rate of 2 percent was selected. This annual growth rate was then applied to all the MPO's funding programs. Forecasted future revenues for LPA funding programs also applied a 2 percent per year growth rate.

Forecast Time Bands

Future forecasted revenues were organized into time bands so that the future funds could reflect year of expenditure (YOE) values that inform the development of Arrive 2050's fiscally constrained plan. The time bands identified were:

- **Current TIP:** 2025–2028
- **Short Term:** 2029–2033
- **Mid-Term:** 2034–2042
- **Long Term:** 2043–2050

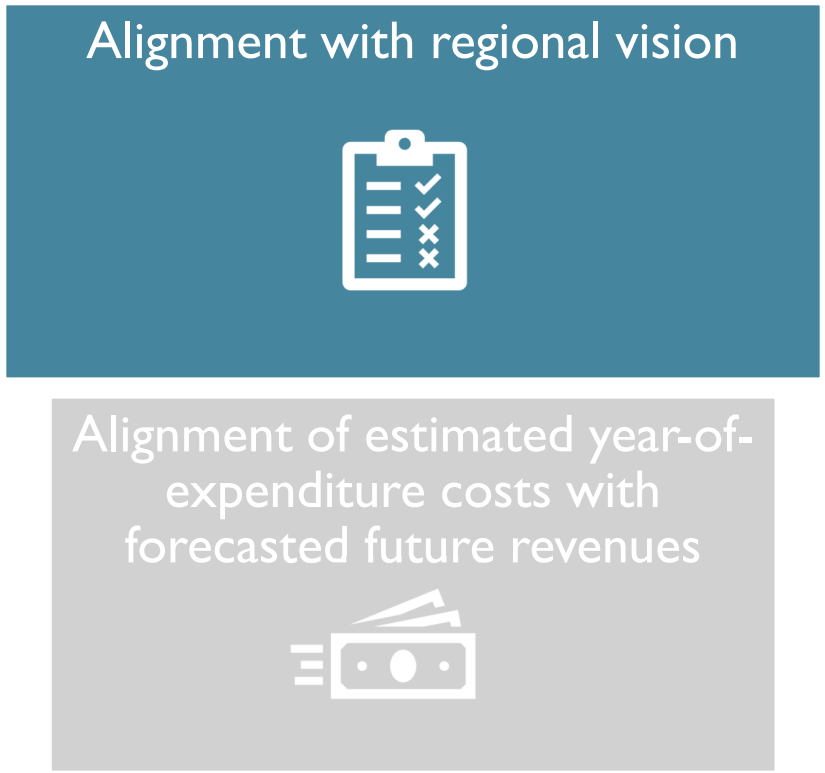
Future Revenue Forecasts for MPO Programs

The resulting future revenue forecasts for the MPO's key funding programs are summarized by time band. Future revenues were also forecasted for the city and county partners, and were shown to have sufficient funding to support matching Federal funding and to keep up required local system preservation and **operations and maintenance**. More details on future funding is shown in Appendix E.

Fiscally Constrained Plan

A key requirement of the metropolitan transportation planning process is the development of a fiscally constrained plan that identifies not only multimodal improvements that can be implemented within the constraints of reasonably expected future transportation revenues through the life of the MTP but also provides a road map for operating and maintaining the existing and future multimodal transportation system.

The projects included in the fiscally constrained plan were identified based on two main criteria:



System Preservation

The preservation of the existing multimodal transportation system is an Arrive 2050 goal. Current system preservation funding levels (not related to day-to-day O&M activities) for the MPO's local jurisdictions were analyzed. This assessment provides a pavement management funding constraint through Arrive 2050's short-term period, which is summarized by local jurisdiction in **Table 30**.

Federal Revenue for Pavement Management

As demonstrated by the budget analysis for Bismarck and NDDOT, the BMMPO's member jurisdictions spend a large portion of their local transportation dollars on maintaining the non-NHS system, indicating that the Arrive 2045 funding policy and current practice by jurisdictional partners can be assumed going forward.

Local Revenue for Pavement Management

Pavement management is primarily funded through local revenue sources. A preliminary review identifies sufficient local revenue sources to cover pavement management activities. However, local revenue sources are often supplemented by federal funds for pavement management projects, especially for larger or more expensive projects or projects on the NHS.

City of Bismarck

Based on a review of Bismarck's CIP between 2017 and 2023, on average, the city spent $16,784,353 on maintenance of the non-NHS and local transportation system. Bismarck's local revenue alone is more than the annual average estimated to cover the non-NHS pavement management activities in the entire BMMPO area. However, the more than $16 million spent on average by the city for maintenance activities includes those spent on non-NHS pavement and local pavement. Considering all the BMMPO's local jurisdictions and local revenue sources by each jurisdiction, it is

anticipated that the annual average non-NHS pavement management expenses shown in **Table 31** are financially constrained.

State of North Dakota

Based on the 2021–2023 biennial budget, NDDOT receives approximately $437 million in state funds per year. Approximately 91 percent ($397 million) of the funding goes toward NDDOT's maintenance and highway programs. NHS annual average pavement management expenses through 2035 are $8,429,643, or 2.1 percent of NDDOT's funds designated for pavement management activities. Considering NDDOT's entire statewide system, BMMPO's NHS network needs, and federal formula funds NDDOT receives for pavement management projects on the NHS, it is anticipated that the annual average NHS pavement management expenses shown in **Table 31** are financially constrained.

Table 30: Federal Funding Targets by Roadway Project Activity

Federal Target	NHS	Non-NHS
Pavement Management	90%	18%
Expansion	10%	82%

Table 31: Fiscally Constrained Annual Average NHS and Non-NHS Management Expenses by MPO Jurisdiction

Jurisdiction	Program	NHS	Non-NHS	Total
Burleigh County	Total (2024–2035)	$16,280,222	$32,826,627	$49,106,849
	Annual Average	$1,356,685	$2,735,552	$4,092,237
Morton County	Total (2024–2035)	$23,733,818	$12,581,421	$36,315,239
	Annual Average	$1,977,818	$1,048,452	$3,026,270
City of Bismarck	Total (2024–2035)	$43,774,933	$111,172,085	$154,947,018
	Annual Average	$3,647,911	$9,264,340	$12,912,251
City of Lincoln	Total (2024–2035)	$0	$1,110,079	$1,110,079
	Annual Average	$0	$92,507	$92,507
City of Mandan	Total (2024–2035)	$18,442,455	$31,643,226	$50,085,681
	Annual Average	$1,536,871	$2,636,936	$4,173,807
MPA Total	**Total (2024–2035)**	**$101,155,717**	**$189,333,438**	**$290,489,155**
	Annual Average	**$8,429,643**	**$15,777,787**	**$24,207,430**

Arrive 2050 Fiscally Constrained Plan

Arrive 2050's fiscally constrained plan is organized into the time bands described in the **Arrive 2050 Funding Plan** chapter and provides costs in terms of both 2024 dollars as well as estimated YOE costs. The fiscally constrained plan also identifies the expected funding sources for each project in addition to each project's local agency sponsor.

Committed Projects

Projects identified in Bismarck-Mandan MPO's 2024–2027 TIP as major capital improvements are considered committed projects and represent the first phase of the fiscally constrained plan. The projects included in the short-term phase of the fiscally constrained plan are considered candidates for the MPO's annual TIP documents through the year 2033.

Table 32 details the region's committed projects, while **Figure 41** shows their locations.

Fiscally Constrained Projects

Projects included in Arrive 2050's fiscally constrained plan were selected based on how well they align with the regional vision for the future transportation system, how well estimated YOE costs align with forecasted revenue constraints, and guidance from local jurisdiction staff. **Table 33** through **Table 38** detail the fiscally constrained plan as organized in the short-, mid-, and long-term time bands, while **Figure 42** through **Figure 44** show the locations of the fiscally constrained projects in the MPO region. An 'R' next to the number in the tables indicates that the project is a rehabilitation or reconstruction. No letter indicates an expansion project. An 'a' or 'b' indicates a phased project.

Regional Illustrative Projects

Arrive 2050's series of alternatives includes several projects that are considered regionally significant and align well with the regional vision for the future transportation system but have cost estimates that exceed future revenue forecasts and thus do not fit in the fiscally constrained plan. These alternatives are considered regional illustrative projects and are retained in the event that future funding capacity would allow for their implementation, such as an expansion in future revenues from NDDOT funding programs or as a recipient of discretionary grant funding. The regional illustrative projects are presented in **Table 39** and shown in **Figure 45**. **Appendix F** contains the Regional Illustrative Project List along with potential sources of funds for each project.

Discretionary Grant Funding Opportunities

The list of projects that are consistent with the Bismarck-Mandan area's transportation goals and meet the safety and mobility needs exceeds anticipated future fiscally constrained funding levels. This is the foundation of the illustrative project list shown in **Figure 45**. The current funding environment from the federal government has several discretionary grant opportunities, including:

- **Rebuilding American Infrastructure with Sustainability and Equity** (RAISE)
- **Multimodal Project Discretionary Grant** (MPDG)
- **Rural Opportunities to Use Transportation for Economic Success** (ROUTES)
- **Strengthening Mobility and Revolutionizing Transportation** (SMART)
- **Bridge Investment Program** (BIP)

These grant programs all have different eligibility requirements and selection criteria, and some programs will align better with projects than others.

Table 32: Committed Projects, 2024–2028

Id	Corridor	From	To	Project Description	Construction Year	Funding Program
1	S Washington Street	Drainage Ditch	Burleigh Avenue	Widen from two to three lanes	2024	Urban Roads
2	Mandan Downtown			Reconstruction	2025	Urban Grant
3	Mandan Memorial Highway			Reconstruction	2025	Urban Regional Roads
4	Burleigh Avenue	S Washington Street	Boston Drive	Widen from two to three lanes	2026	City Funded
5	Centennial Road	Jerico Road		Centennial Road/Jerico Road, N 16th Street/Braman Avenue signals	2026	Safety
6	Braman Avenue	N 16th Street		Centennial Road/Jerico Road, N16th Street/Braman Avenue signals	2026	Safety
7	Century Avenue	N 19th Street		Bismarck/Century and 19th Street signals	2026	Safety
8	Old Red Trail	40th Avenue NW	Urban Limits	Reconstruction	2027	Urban Roads
9	Bismarck Expressway	N Washington Street		Expressway/Washington Street signals	2027	Urban Regional Roads
10	Bismarck Expressway	N 26th Street		Expressway/26th Street signals	2027	Urban Regional Roads
11	S Washington Street	Denver Avenue		Washington St and Denver Ave signals	2027	Urban Regional Roads
12	S 12th Street	Burleigh Avenue	Santa Fe Avenue	Asphalt Mill and Overlay	2028	Urban Roads

Source: Bismarck-Mandan MPO, *FY2017–FY 2025 Transportation Improvement Programs*

Figure 41: Committed Projects, 2024–2028

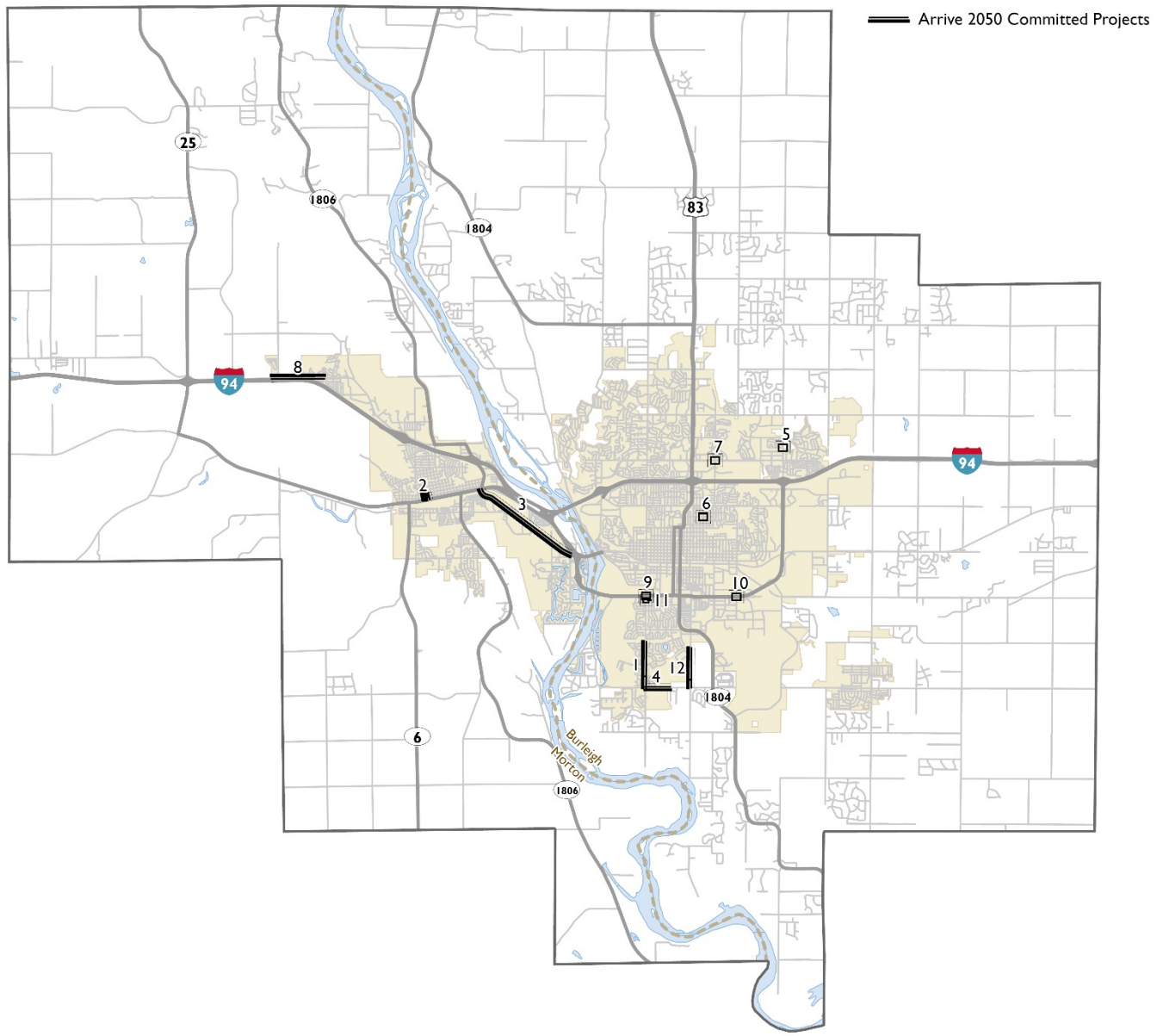


Table 33: Fiscally Constrained Short-Term Urban Roads Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
97	3rd Street SW	6th Avenue/ ND 1806	Memorial Highway	Restripe/overlay to include turn lanes or restripe to three-lane section with center turn lane and no parking	$500,000	$660,000	Mandan	$530,640	$129,360
107	Burleigh Avenue	Boston Drive	University Drive/ND 1804	Asphalt Mill and Overlay	$1,300,000	$1,710,000	Bismarck	$1,374,840	$335,160
118	52nd Street	Main Avenue	Divide Avenue	Asphalt Mill and Overlay	$1,500,000	$1,970,000	Burleigh/ Bismarck	$1,583,880	$386,120
130	Riverwood Avenue	Memorial Highway	3rd Street SE	Reconstruction	$2,400,000	$3,160,000	Mandan	$2,540,640	$619,360
109	52nd Street	Apple Creek Road	Main Avenue	Asphalt Mill and Overlay	$1,200,000	$1,580,000	Bismarck	$1,270,320	$309,680
133a	66th Street SE	Lincoln Road	Northgate Drive	Mill and Overlay	$2,000,000	$2,630,000	Burleigh/ Lincoln	$2,114,520	$515,480
128	Calgary Avenue	14th Street	East of St Lawrence Street (end of ditch section)	Reconstruction	$2,400,000	$3,160,000	Bismarck	$2,540,640	$619,360
103	43rd Avenue N	52nd Street		Intersection Capacity Improvement/Roundabout	$3,000,000	$3,950,000	Bismarck	$3,175,800	$774,200
123	Main Avenue	Memorial Highway	Washington Street	Concrete Pavement Repair	$2,000,000	$2,630,000	Bismarck	$2,114,520	$515,480
117	52nd Street	Gold Drive	43rd Avenue N	Asphalt Mill and Overlay	$500,000	$660,000	Bismarck	$530,640	$129,360
126	Main Avenue	12th Street	Airport Road	Concrete Pavement Repair	$1,100,000	$1,450,000	Bismarck	$1,165,800	$284,200
110	57th Avenue N	Tyler Parkway	Washington Street	Asphalt Mill and Overlay	$1,200,000	$1,580,000	Bismarck	$1,270,320	$309,680

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
133b	66th Street SE	Apple Creek Road	E Main Avenue/County Road 10	Mill and Overlay	$2,000,000	$2,630,000	Burleigh/ Bismarck	$2,114,520	$515,480
127	Main Avenue	Airport Road	26th Street	Concrete Pavement Repair	$1,100,000	$1,450,000	Bismarck	$1,165,800	$284,200
129	Sunset Drive	Division Street		Grade Raise	$1,500,000	$1,970,000	Mandan	$1,583,880	$386,120
115	US 83 East Frontage Road (Ridgedale Street)	Elbowoods Lane	64th Avenue N	Asphalt Mill and Overlay	$900,000	$1,180,000	Bismarck	$948,720	$231,280
121	Washington Street	48th Avenue S	Burleigh Avenue	Asphalt Mill and Overlay	$1,200,000	$1,580,000	Burleigh/ Bismarck	$1,270,320	$309,680
112	Tyler Parkway	Cogburn Road	57th Avenue N	Asphalt Mill and Overlay	$1,500,000	$1,970,000	Bismarck	$1,583,880	$386,120
101	3rd Street SW	6th Avenue SE	ND 6	Restripe/overlay to include turn lanes or restripe to three-lane section with center turn lane and no parking	$500,000	$660,000	Mandan	$530,640	$129,360
113	Tyler Parkway	57th Avenue N	ND 1804	Asphalt Mill and Overlay	$1,200,000	$1,580,000	Bismarck	$1,270,320	$309,680
			Total		**$29,000,000**	**$38,160,000**		**$30,680,640**	**$7,479,360**

Table 34: Fiscally Constrained Short-Term HSIP Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
11	Lincoln Road	Yegen Road/ Airway Avenue		Intersection Capacity Improvement	$3,000,000	$3,950,000	Bismarck	$3,555,000	$395,000
105	Sunset Drive	27th Street NW		Roundabout	$2,250,000	$2,960,000	Mandan	$2,664,000	$296,000
		Total			**$5,250,000**	**$6,910,000**		**$6,219,000**	**$691,000**

Figure 42: Fiscally Constrained Short-Term Urban Roads and HSIP Projects

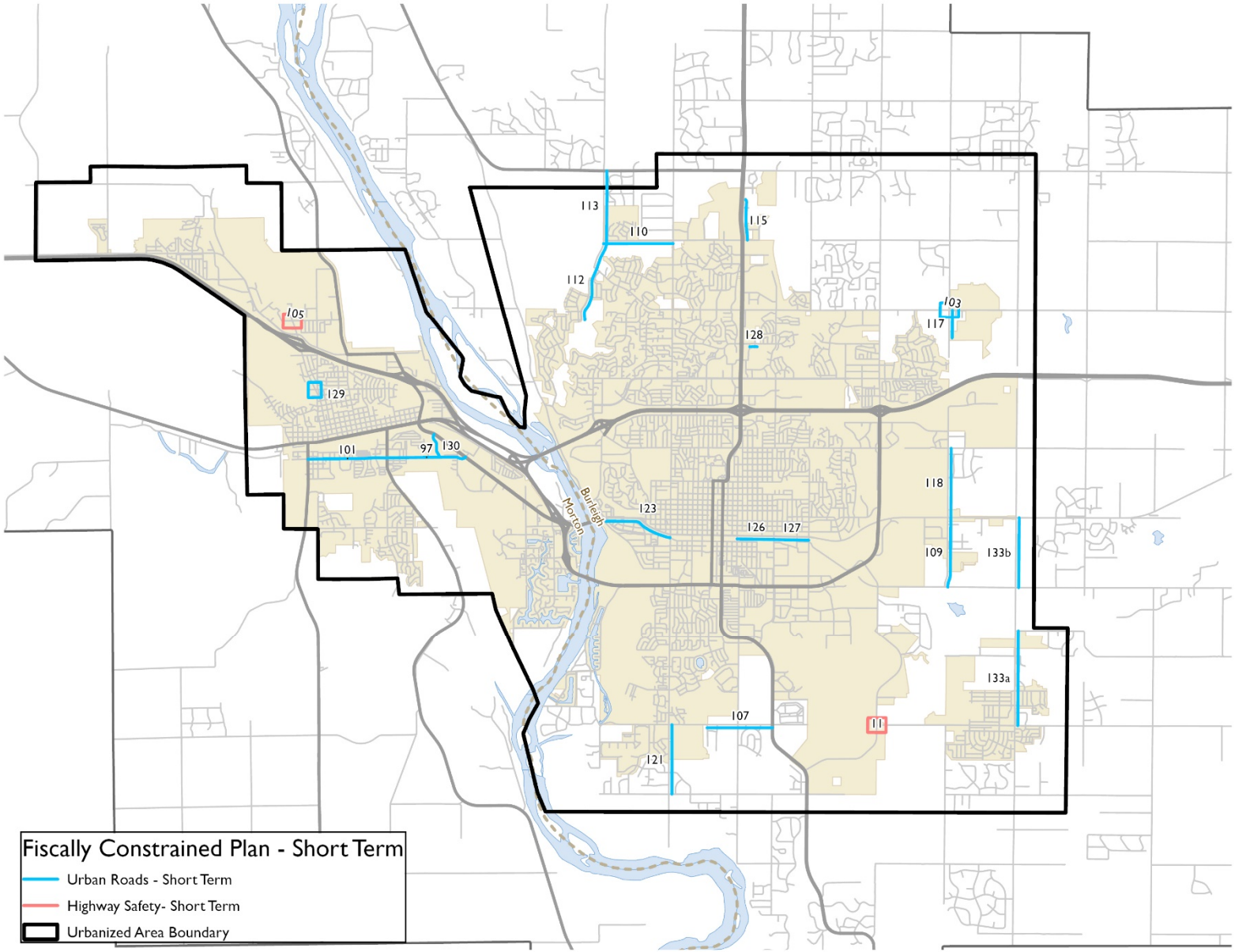


Table 35: Fiscally Constrained Mid-Term Urban Roads Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
71a	Sunset Drive	Middle School	37th Street NW	Construct as three-lane urban section	$5,325,000	$9,220,000	Mandan/ Morton	$7,376,000	$1,844,000
25a	Main Avenue	Bismarck Expressway	52nd Street	Widen from two-lane to three-lane section (including intersection improvement at 52nd Street)	$15,400,000	$26,670,000	Burleigh/ Bismarck	$21,336,000	$5,334,000
17	52nd Street NE	43rd Avenue NE	E Century Avenue	Widen from two-lane to three-lane section/build new three-lane section	$15,836,000	$27,420,000	Burleigh/ Bismarck	$21,936,000	$5,484,000
70a	8th Avenue NW	27th Street NW	37th Street NW	Construct three-lane urban section	$7,100,000	$12,290,000	Mandan/ Morton	$9,832,000	$2,458,000
			Total		**$43,661,000**	**$75,600,000**		**$60,480,000**	**$15,120,000**

Table 36: Fiscally Constrained Mid-Term HSIP Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
82	3rd Avenue NE	5th Street NE	Division Street NW	Narrow Pavement	$5,925,000	$10,260,000	Mandan	$9,234,000	$1,026,000
102	Main Avenue	26th Street		Intersection Capacity Improvement/Roundabout	$3,000,000	$5,200,000	Bismarck	$4,680,000	$520,000
			Total		**$8,925,000**	**$15,460,000**		**$13,914,000**	**$1,546,000**

Figure 43: Fiscally Constrained Mid-Term Urban Roads and HSIP Projects

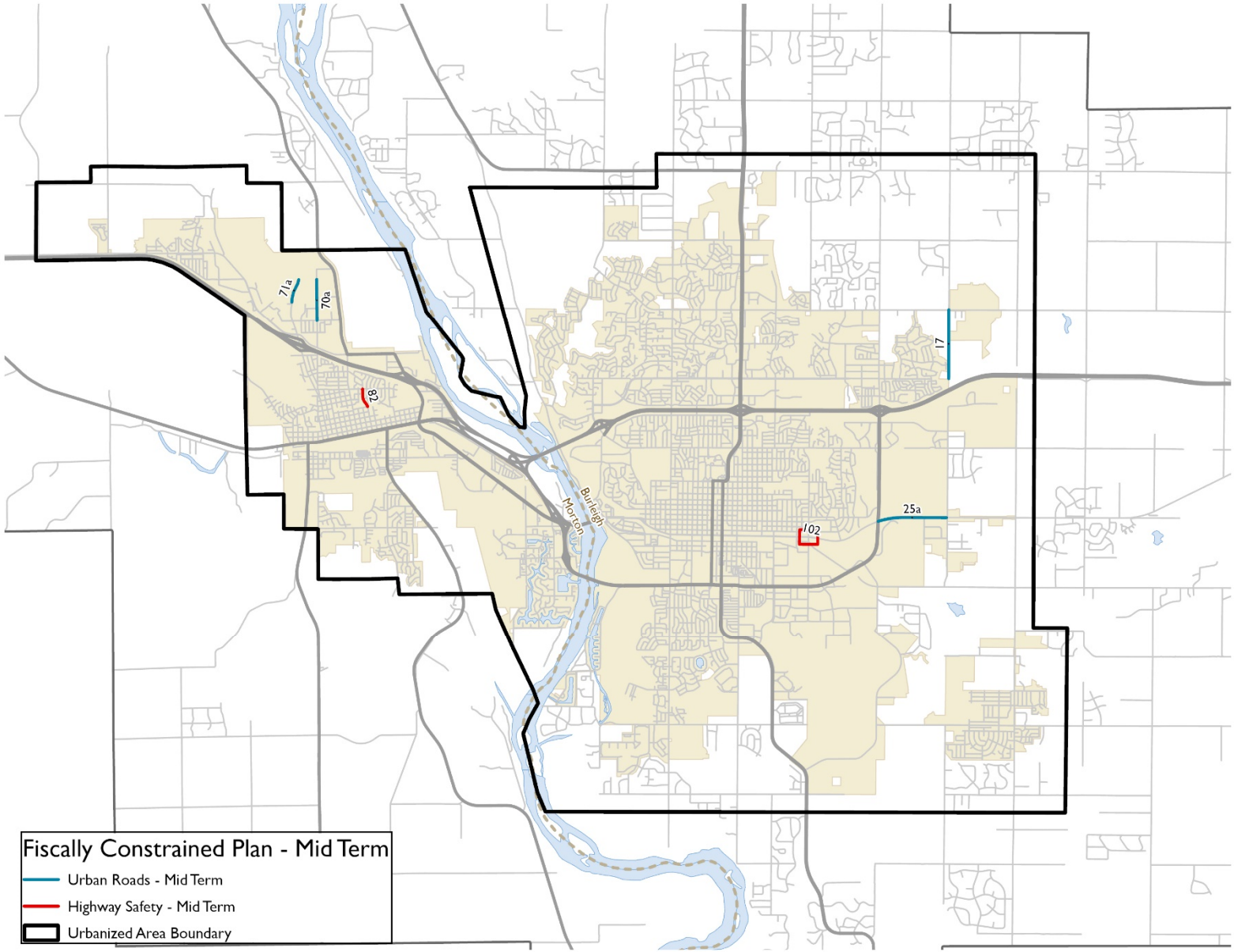


Table 37: Fiscally Constrained Long-Term Urban Roads Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
72a	37th Street NW	Sunset Drive	ND 1806	Construct urban three-lane for arterial connection	$9,585,000	$23,170,000	Mandan/ Morton	$16,682,400	$6,487,600
7	66th Street	Apple Creek	Old Highway 10/E Main Avenue	Widen from two-lane to three-lane section	$14,948,000	$36,130,000	Burleigh/ Lincoln	$26,013,600	$10,116,400
25b	Main Avenue	52nd Street	66th Street	Widen from two-lane to three-lane section	$15,400,000	$37,220,000	Burleigh/ Lincoln/ Bismarck	$26,798,400	$10,421,600
Total					**$39,933,000**	**$96,520,000**		**$69,494,400**	**$27,025,600**

Table 38: Fiscally Constrained Long-Term HSIP Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
104	Burleigh Avenue	Boston Drive		Intersection Capacity Improvement/Roundabout	$3,000,000	$7,250,000	Bismarck	$6,525,000	$725,000
Total					**$3,000,000**	**$7,250,000**		**$6,525,000**	**$725,000**

Figure 44: Fiscally Constrained Long-Term Urban Roads and HSIP Projects

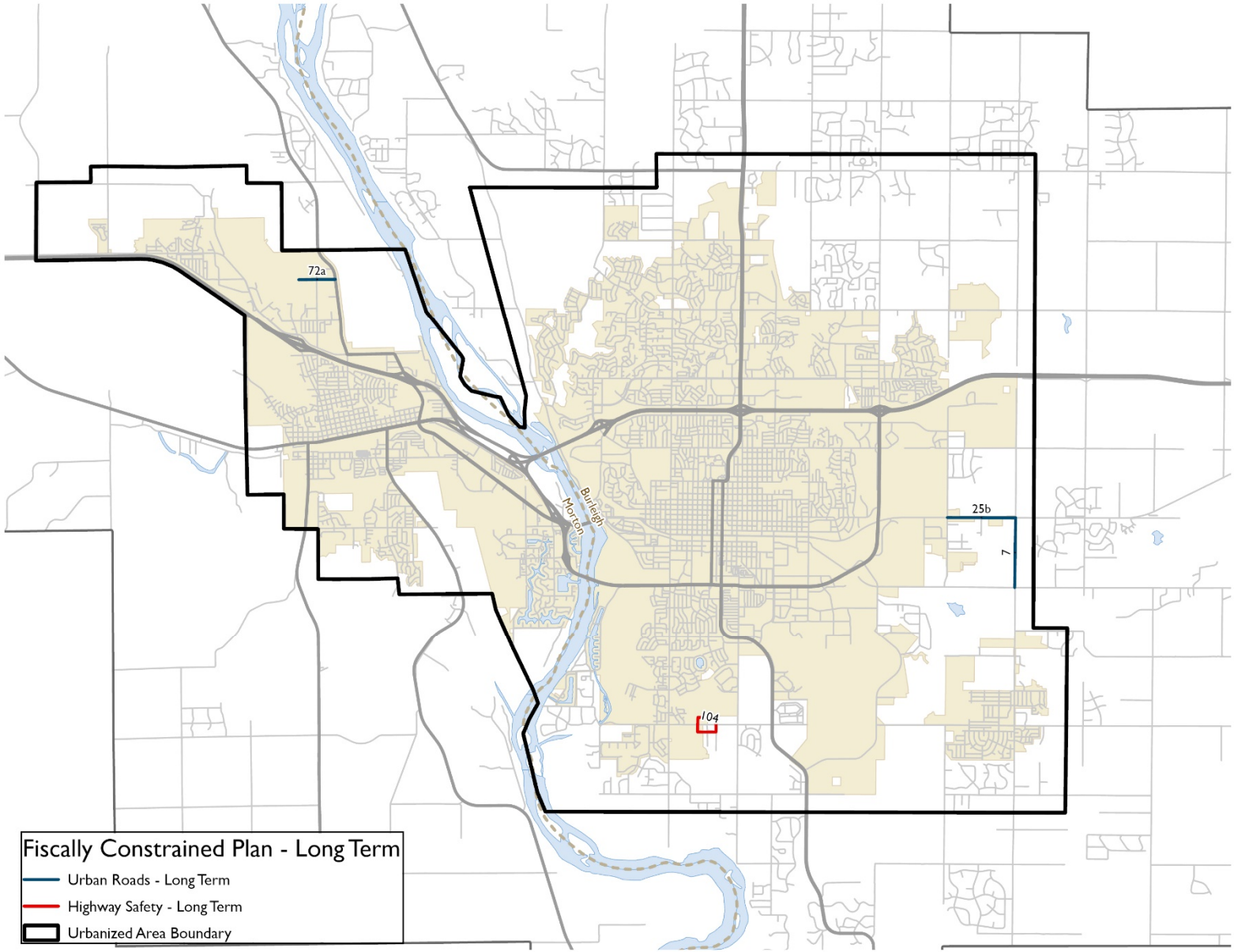


Table 39: Regional Illustrative Projects

ID	Corridor Location	From	To	Description	Estimated Cost (2024 $)
1	71st Avenue	Centennial Road	66th Street	Reconstruct as a three-lane rural section	$18,744,000
2	66th Street	43rd Avenue	71st Avenue	Reconstruct/new construct as a three-lane urban section	$27,690,000
3	66th Street	Century Avenue	43rd Avenue	Construct as three-lane urban section (tied with project for interchange with I-94 at 66th Street)	$6,816,000
4	66th Street	I-94	Century Avenue	Construct as three-lane urban section (tied with project for interchange with I-94 at 66th Street)	$6,390,000
5	66th Street	17th Avenue	I-94	Construct as three-lane urban section (tied with project for interchange with I-94 at 66th Street)	$14,910,000
6	66th Street	Old Highway 10/E Main Avenue	17th Avenue	Construct as three-lane urban section (tied with project for interchange with I-94 at 66th Street)	$14,200,000
8	I-94	66th Street		New interchange	$40,000,000
12	Burleigh Avenue	High Plains Road	University Drive	Widen to three-lane urban section; consider roundabout at 12th St intersection	$15,612,000
13	48th Avenue S	University Drive	66th Street	Construct two-lane rural section and structure improvements at Apple Creek crossing	$7,560,000
14	66th Street	Lincoln Road	Northgate Drive	Widen from two-lane to three-lane section	$20,276,000
15	66th Street	48th Avenue S	Lincoln Road	Reconstruct as two-lane urban section	$2,440,000
16	Century Avenue	52nd Street	66th Street	Construct three-lane urban section	$16,046,000
18	52nd Street NE	E Century Avenue	17th Avenue NE	I-94 overpass and street improvements from Century Avenue to Divide Avenue	$25,836,000
19	52nd Street	Apple Creek Road	Main Avenue	Widen to three-lane urban section; consider roundabout at Old Highway 10/E Main Street intersection	$31,448,000
20	52nd Street	Main Avenue	17th Avenue	Widen to three-lane urban section	$14,224,000

ID	Corridor Location	From	To	Description	Estimated Cost (2024 $)
22	Centennial Road	Jericho Road	43rd Avenue	Widen from three-lane to five-lane urban section	$16,776,000
24a	Divide Avenue	Bismarck Expressway	52nd Street	Construct as three-lane urban section	$14,800,000
24b	Divide Avenue	52nd Street	66th Street	Reconstruct three-lane urban section	$14,200,000
26	Main Avenue	Hay Creek Crossing		Structural replacement	$685,000
27	E Main Avenue	Airport Road	26th Street	Reconstruct as five-lane urban section	$11,271,000
28	E Main Avenue	12th Street	Airport Road	Reconstruct as five-lane urban section	$11,713,000
29	E Main Avenue	7th Street	12th Street	Reconstruct as three-lane urban section	$7,956,000
31	Washington Street	Drainage Channel	Denver Avenue	Turn lane improvements.	$924,300
32	26th Street	43rd Avenue	71st Avenue	Construct as three-lane urban section	$17,688,000
33	N 19th Street	57th Avenue NE	71st Avenue	Reconstruct three-lane urban section	$14,200,000
34	N 19th Street	Skyline Boulevard	57th Avenue NE	Reconstruct three-lane urban section	$12,496,000
35	57th Avenue	State Street	26th Street	Construct three-lane urban section	$14,058,000
36	43rd Avenue	N 26th Street	Roosevelt Drive	Reconstruct as three-lane urban section	$35,358,000
37	Calgary Avenue	DMVW Railroad	Haycreek Road	Construct two-lane urban section across DMVW railroad with grade separation	$50,690,000
40	71st Street	State Street		Intersection capacity and safety improvements	$5,214,000
41	57th Avenue	52nd Street NE	66th Street	Pave two-lane rural section	$6,534,000
42	57th Avenue	Centennial Road	52nd Street NE	Widen from two-lane rural to three-lane urban section; access control	$15,400,000
43	57th Avenue	26th Street	Centennial Road	Paving	$15,400,000

ID	Corridor Location	From	To	Description	Estimated Cost (2024 $)
44	71st Avenue	State Street	Centennial Road	Widen to three-lane section; consider roundabout at 26th Street intersection	$30,806,000
45	Centennial Road	57th Avenue	71st Avenue	Widen to three-lane section	$10,092,000
46	Centennial Road	43rd Avenue	57th Avenue	Widen from two-lane to three-lane rural section	$15,400,000
47	43rd Avenue	52nd Street	66th Street	Widen to three-lane urban section; consider a roundabout at 52nd Street	$24,646,000
49	State Street	Skyline Boulevard	57th Avenue	Widen to six lanes from north of Skyline Boulevard through 57th Avenue; intersection improvement at 57th Avenue. (Not preferred by NDDOT).	$21,450,000
50	State Street	Calgary Avenue	Skyline Boulevard	At-grade improvements: Calgary Avenue and 43rd Avenue; widening to six-lane urban section from Calgary Avenue through Skyline Boulevard intersection. (Not preferred by NDDOT).	$35,988,450
51	Burnt Creek Loop North/River Road	ND 1804		Intersection capacity improvement	$5,925,000
52	State Street	I-94		Interchange reconstruction	$49,770,000
53	N 19th Street	Capitol Avenue		Intersection capacity improvement	$1,777,500
54	Tyler Parkway	Schafer Road	Burnt Boat Drive	Intersection capacity improvement.; add turn lanes and include safety improvements	$1,777,500
55	Apple Creek Road	Yegen Road		Intersection capacity improvement	$11,850,000
56	Ash Coulee Drive	Tyler Parkway		Roundabout	$3,000,000
57	71st Avenue/ND 1804	15th Street/ Tyler Parkway	State Street	Widen from two-lane to three-lane section	$31,262,000
58	Tyler Parkway	57th Avenue	ND 1804/ 71st Avenue	Construct as three-lane urban section	$14,200,000
59	57th Avenue	Washington Street	State Street	Widen to three-lane urban section; improve Washington Street intersection	$14,652,000

ID	Corridor Location	From	To	Description	Estimated Cost (2024 $)
61	57th Avenue	Tyler Parkway	Crested Butte Road	Construct as three-lane urban section	$14,342,000
62	57th Avenue	River Road	Tyler Parkway	Construct as three-lane urban section	$20,874,000
91	56th Avenue NW	I-94 Business Loop (Main Street)	Old Red Trail	Construct as three-lane urban section	$34,222,000
92	Boundary Road	56th Avenue/I-94 Interchange	32nd Avenue NW	Construct as three-lane urban section	$22,436,000
93	32nd Avenue W	I-94 Business Loop (Main Street)	Boundary Road (Future)	Construct as two-lane urban section	$26,536,000
94	Boundary Road	32nd Avenue	Sunset Drive	Construct as three-lane urban section	$23,430,000
95	31st Street NW	Lohstreter Road	Boundary Road (Future)	Construct as two-lane urban section	$12,276,000
96	Division Street	Sunset Drive	Lohstreter Road	Construct three-land urban section to extend Division Street	$13,490,000
99	56th Avenue NW	I-94		New interchange	$34,250,000
100	32nd Avenue	I-94		Grade separation overpass/underpass	$20,550,000
136	66th Street	Northgate Drive	Apple Creek Road	Grade separation, new structure over Apple Creek, roundabout at intersection with Apple Creek Road	$31,900,000

Figure 45: Regional Illustrative Projects

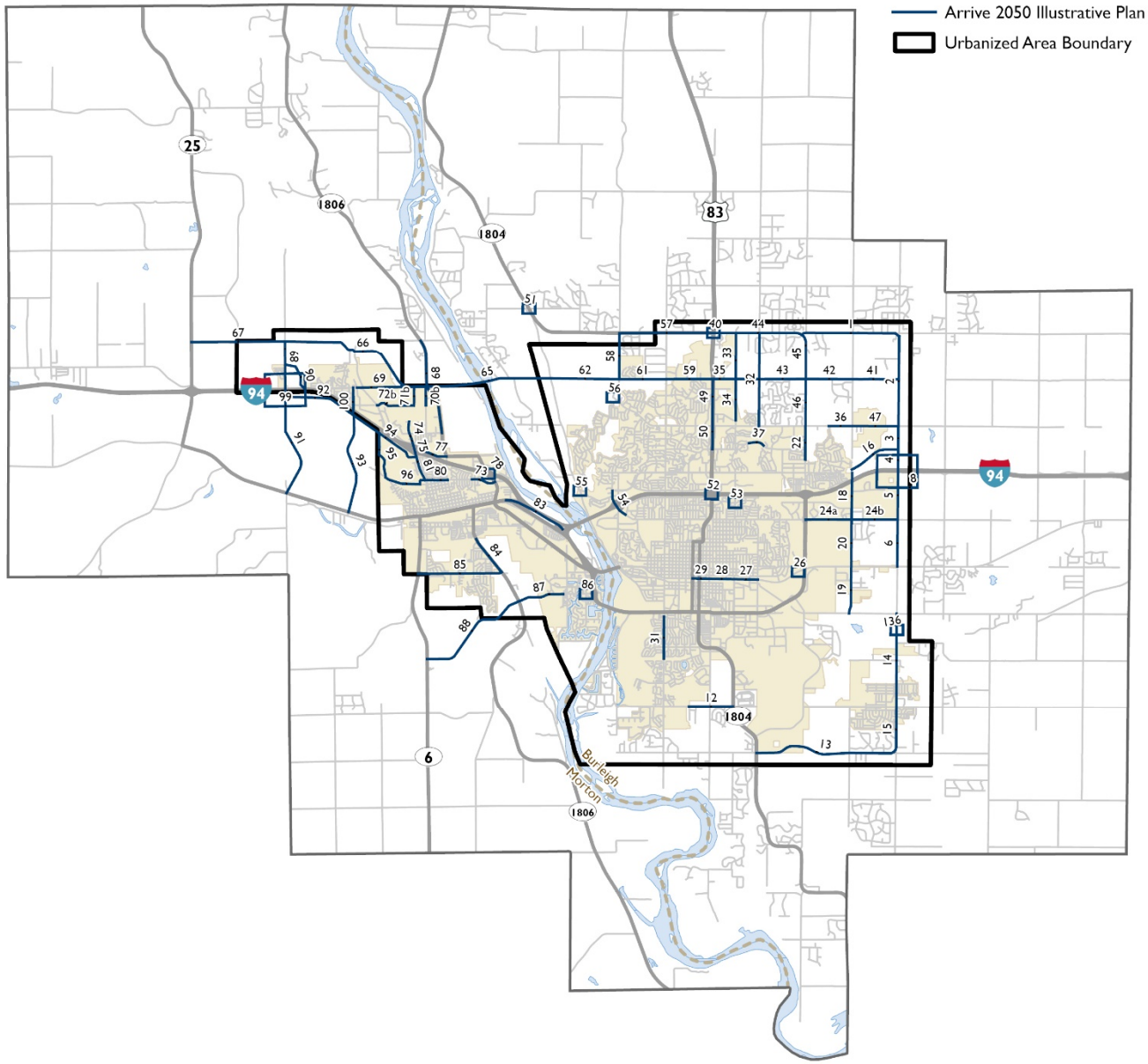


Figure 46: Transportation Alternatives Short-Term Projects

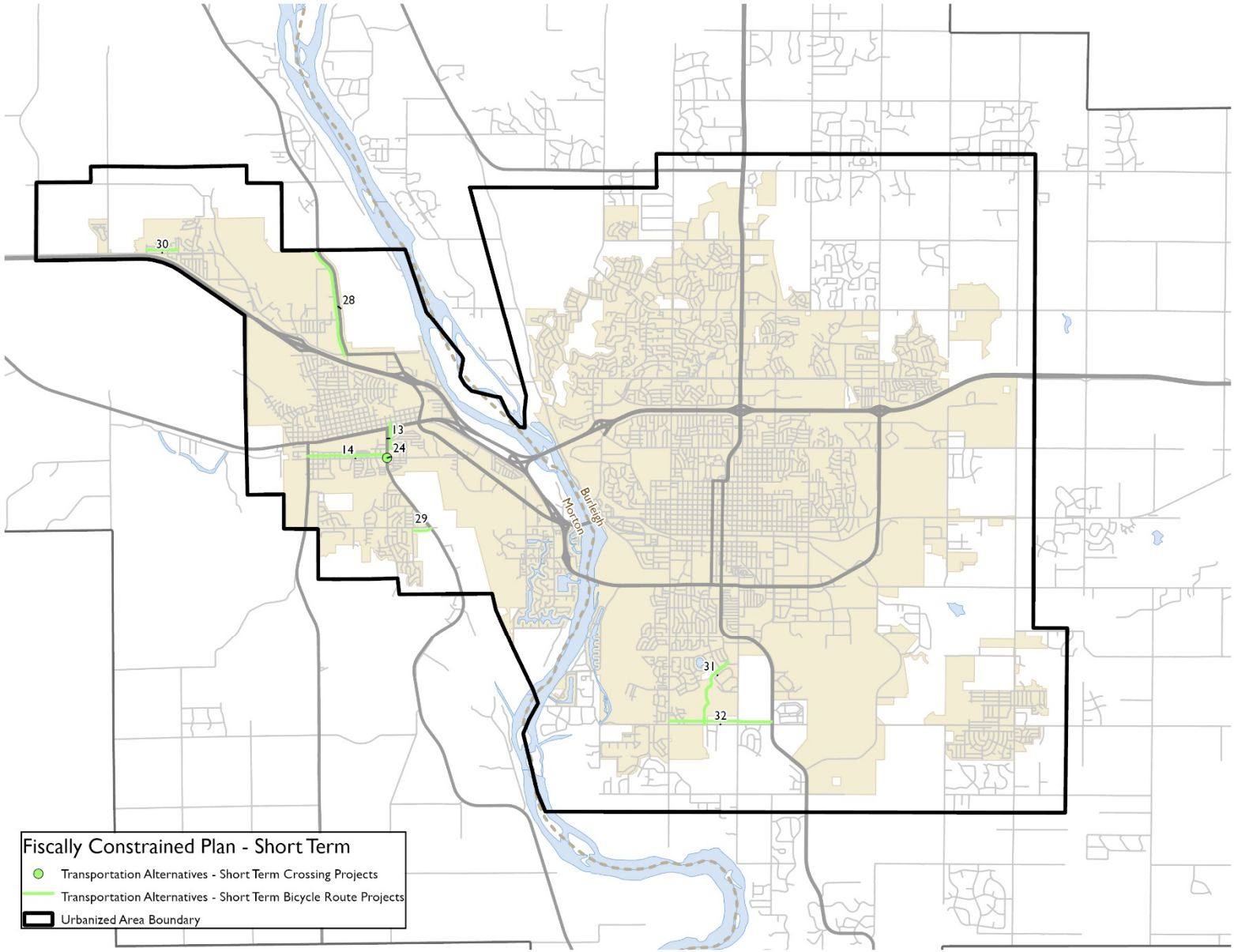


Table 40: Transportation Alternatives Short-Term Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	TA Funds	Local Funds
13	6th Avenue SE	3rd Street SE	1st Street NE	Shared use path	$152,000	$200,000	Mandan	$161,800	$38,200
14	3rd Street SW and SE	US 6	6th Avenue SE	Buffered bike lanes	$65,000	$90,000	Mandan	$72,810	$17,190
24	3rd Street SE	6th Avenue SE		Improved signaling; curb extensions, centerline hardening, or modern roundabout	$134,000	$180,000	Mandan	$145,620	$34,380
28	ND 1806	Old Red Trail	38th Street	Mill/overlay	$700,000	$920,000	Mandan	$744,280	$175,720
29	19th Street SE	ND 1806	14th Avenue SE	Mill/overlay	$300,000	$390,000	Mandan	$315,510	$74,490
30	Old Red Trail	43rd Avenue NW		Construct shared use path	$300,000	$390,000	Mandan	$315,510	$74,490
31	Cottonwood Park Trail	Burleigh Avenue		Asphalt overlay	$90,000	$120,000	Bismarck	$97,080	$22,920
32	Burleigh Avenue Trail	Washington Street		Overlay with patching	$190,000	$250,000	Bismarck	$202,250	$47,750
		Total			**$1,931,000**	**$2,540,000**		**$2,054,860**	**$485,140**

Figure 47: Transportation Alternatives Mid-Term Projects

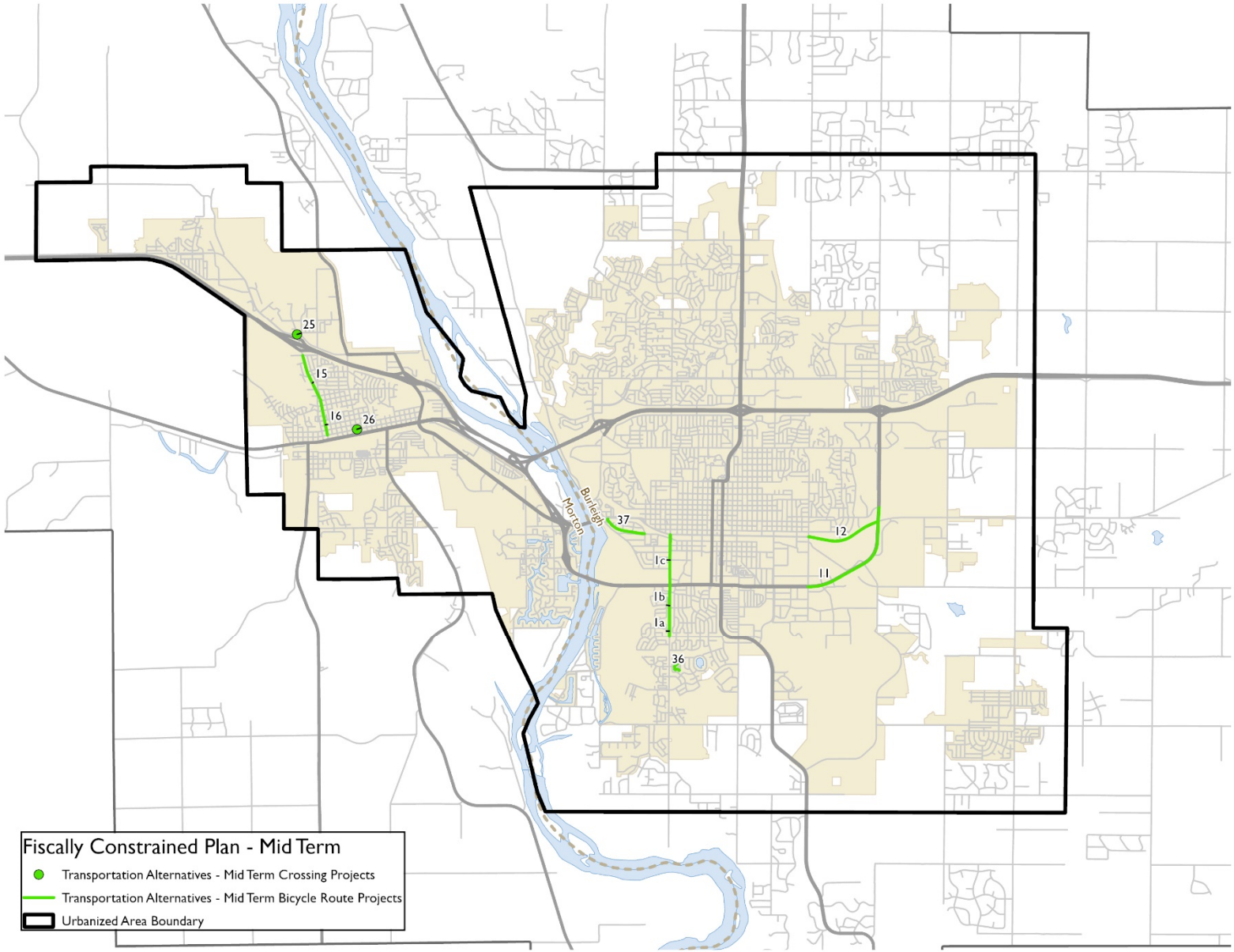


Table 41: Transportation Alternatives Mid-Term Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
-				Other network preservation projects		$533,000	Region-wide	$431,197	$101,803
1a	S Washington Street	W Wachter Avenue	W Reno Avenue	Shared use path	$172,000	$300,000	Bismarck	$242,700	$57,300
1b	S Washington Street	W Reno Avenue	Bismarck Expressway	Shared use path	$131,000	$230,000	Bismarck	$186,070	$43,930
1c	S Washington Street	Bismarck Expressway	W Main Avenue	Shared use path	$299,000	$520,000	Bismarck	$420,680	$99,320
11	E Bismarck Expressway	S 26th Street	E Rosser Avenue	Shared use path	$726,000	$1,260,000	Bismarck	$1,019,340	$240,660
12	E Main Avenue	S 26th Street	E Bismarck Expressway	Shared use path	$443,000	$770,000	Bismarck	$622,930	$147,070
15	Sunset Drive NW	8th Street NW	Boundary Street NW	Buffered or separated bike lanes	$40,000	$70,000	Mandan	$56,630	$13,370
16	6th Ave NW	1st Street NW	8th Street NW	Buffered or separated bike lanes	$29,000	$50,000	Mandan	$40,450	$9,550
25	Sunset Drive NW	Old Red Trail NW		ADA upgrades, widened ramps to accommodate trail crossing on south and east approaches, crosswalk striping, extend sidewalk and crossing on west and north approaches, improved signals, centerline hardening	$35,000	$60,000	Mandan	$48,540	$11,460
26	1st Street NW	Collins Avenue		White edge lines on crosswalks, option for mini-roundabout	$10,000	$20,000	Mandan	$16,180	$3,820

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
36	Southland – Marietta segment	Marietta Drive (N)	Marietta Drive (SE)	Overlay	$50,000	$90,000	Bismarck	$72,810	$17,190
37	Bank of ND Trail	Memorial Highway	Bell Street	Remove and replace trail	$230,000	$400,000	Bismarck	$323,600	$76,400
			Total		**$2,299,000**	**$4,303,000**		**$3,481,127**	**$821,873**

Figure 48: Transportation Alternatives Long-Term Projects

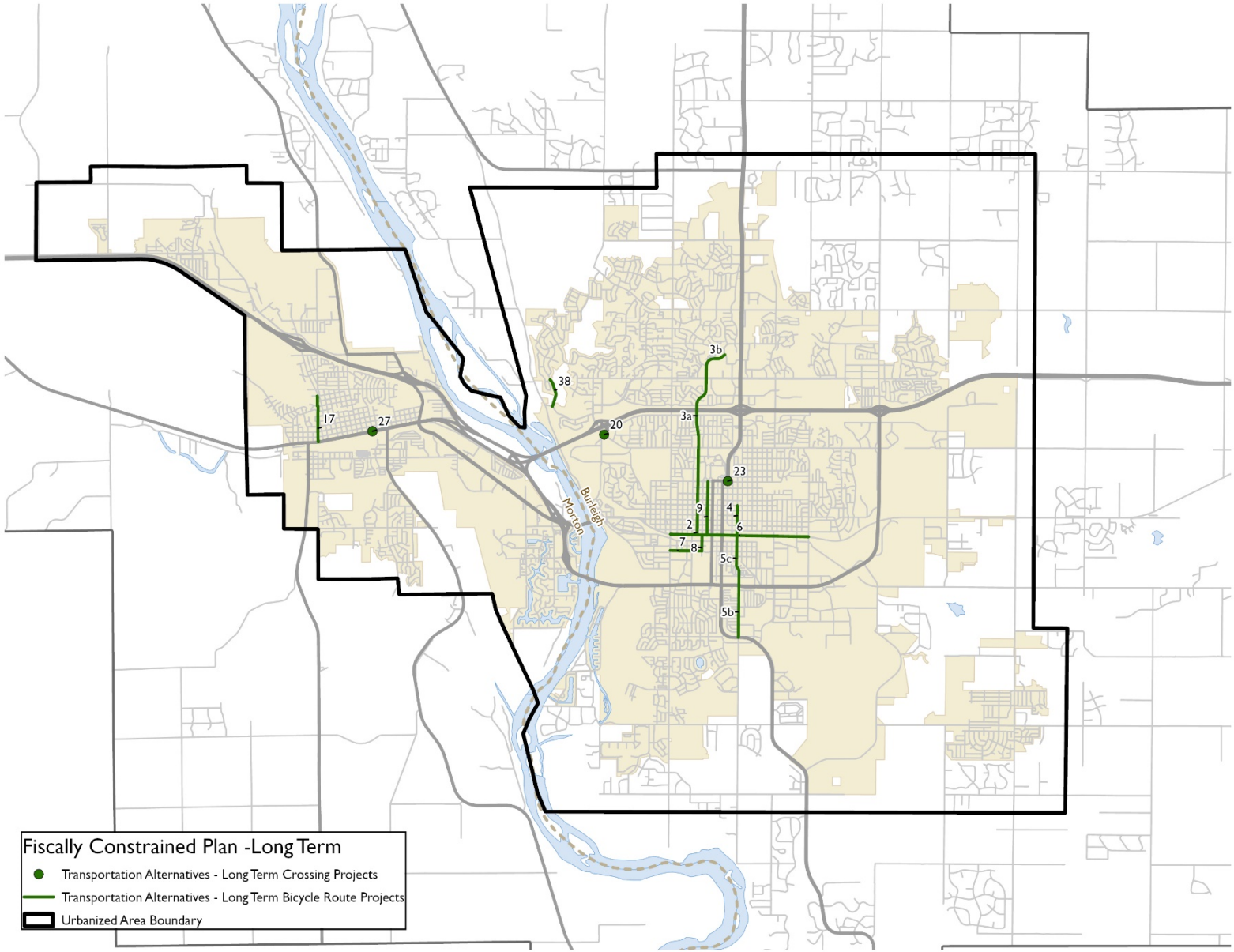


Table 42: Transportation Alternatives Long-Term Projects

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
-				Other network preservation projects		$1,057,000	Region-wide	$1,170,623	$276,377
2	N 4th Street	W Main Avenue	E Boulevard Avenue	Shared lane markings or advisory bike lanes; possible traffic calming	$14,000	$30,000	Bismarck	$24,270	$5,730
3a	N 4th Street	E Boulevard Avenue	Ridgecrest Drive	Buffered bike lanes	$107,000	$260,000	Bismarck	$210,340	$49,660
3b	Dominion Street	Ridgecrest Drive	N 10th Street	Buffered bike lanes	$9,000	$20,000	Bismarck	$16,180	$3,820
4	N 12th Street	E Broadway Avenue	Avenue C	Shared lane markings or advisory bike lanes; possible traffic calming	$6,000	$10,000	Bismarck	$8,090	$1,910
5b	S 12th Street	University Drive	Bismarck Expressway	Buffered or separated bike lanes	$43,000	$100,000	Bismarck	$80,900	$19,100
5c	S 12th Street	E Bismarck Expressway	E Broadway Avenue	Buffered bike lanes	$45,000	$110,000	Bismarck	$88,990	$21,010
6	W and E Main Avenue	N Washington Street	N 26th Street	Buffered or separated bike lanes	$112,000	$270,000	Bismarck	$218,430	$51,570
7	W and E Bowen Avenue	S Washington Street	S 5th Street	Buffered or separated bike lanes	$26,000	$60,000	Bismarck	$48,540	$11,460
8	S 5th Street	E Bowen Avenue	E Main Street	Shared lane markings, standard or buffered bike lane	$13,000	$30,000	Bismarck	$24,270	$5,730
9	N 6th Street	E Main Avenue	E Boulevard Avenue	Shared lane markings or advisory bike lanes; possible traffic calming	$14,000	$30,000	Bismarck	$24,270	$5,730

Project ID	Location	From	To	Project Description	2024 Cost	YOE Cost	Lead Agency(s)	Federal Funds	Local Funds
17	8th Avenue NW	W Main Street	9th Street NW	Shared lane markings or advisory bike lanes (The segment between 2nd Street NW and 4th Street NW may use 7th Avenue NW rather than the 8th Avenue NW unimproved right-of-way.)	$12,000	$30,000	Mandan	$24,270	$5,730
20	Tyler Parkway	I-94 Ramp and W Divide Avenue and Schafer Street		Enlarged pedestrian refuges, removal of channelized right-turn lanes (or Smart Channel Design), tighter turning radii	$120,000	$290,000	Bismarck	$234,610	$55,390
23	State Street	E Boulevard Avenue		Improve crossing east of intersection with marked crosswalk, widened ramps, and ADA upgrades	$40,000	$100,000	Bismarck	$80,900	$19,100
27	E Main Street	3rd Avenue NE		Pedestrian Hybrid Beacon, pedestrian refuge, marked crosswalk	$720,000	$1,740,000	Mandan	$1,407,660	$332,340
38	Clairmont Road	Promontory Place	Burnt Boat Drive	Shared use path.	$160,000	$390,000	Bismarck	$315,510	$74,490
			Total		**$1,441,000**	**$4,527,000**		**$3,662,343**	**$864,657**

Alternative Sources of Funds

In addition to the projects identified for Urban Roads and HSIP funding as part of the Arrive 2050 Fiscally Constrained Plan, other sources of funds serve as opportunities for the MPO and its member jurisdictions to fund additional multimodal transportation improvements. These sources include NDDOT's Urban Grant Program and North Dakota Parks and Recreation Department's (NDPRD) RTP. Further detail about both programs is available in the **Arrive 2050 Funding Plan** section.

Urban Grant Program Candidate Projects

Candidate projects for the UGP were identified by local jurisdiction staff and focus on improvements to roadways found in the core business districts of Bismack and Mandan. NDDOT's UGP policy stipulates that eligible jurisdictions found in the state's MPO areas must comply with their respective MPO's processes for submitting applications to NDDOT.[19]

Table 43 details the Arrive 2050 projects that were identified as candidates under the UGP; **Figure 49** displays their locations in the MPO area. As these projects are funded on a discretionary basis, they do not include timing in the Fiscally Constrained Plan's time bands. An 'R' indicates the project is a rehabilitation or reconstruction project.

Recreational Trails Program Candidate Projects

A series of RTP candidate projects were identified by the Bismarck Parks Department and would seek funds for maintenance activities, including removal and replacement of recreational trails and recreational trail overlays. **Table 44** details the Arrive 2050 RTP candidate projects, while **Figure 50** shows their locations in the MPO area.

Trail in the Scheels Sports Complex

Source: Bismarck Parks and Recreation District

[19] North Dakota Department of Transportation, *Urban Grant Program Policy*

Table 43: Arrive 2050 Urban Grant Program Candidate Projects

ID	Corridor	To	From	Description	Lead Agency	Estimated Cost (2024 $)
124	Main Avenue	N 7th Street	N 12th Street	Concrete pavement repair	Bismarck	$725,000
125	Main Avenue	N Washington Street	N 7th Street	Concrete pavement repair	Bismarck	$1,200,000
131	1st Steet NW	4th Avenue NW	2nd Avenue NW	Downtown Mandan – Phase 2 Reconstruction	Mandan	$4,300,000
132	1st Street NW, 3rd Avenue NW	2nd Avenue NW	Collins Avenue	Downtown Mandan – Phase 3 Reconstruction	Mandan	$4,000,000

Table 44: Arrive 2050 Recreational Trails Program Candidate Projects

ID	Corridor	To	From	Description	Lead Agency	Estimated Cost (2024 $)
33	Hay Creek Trail #3	Lilac Lane	26th Street	Remove and replace trail	Bismarck	$210,000
34	Pebble Creek Trail	Century Avenue	19th Street	Overlay with asphalt patching	Bismarck	$100,000
35	Scheels Complex Trail	Hay Creek Trail #2		Overlay	Bismarck	$110,000

Figure 49: Arrive 2050 Urban Grant Program Candidate Projects

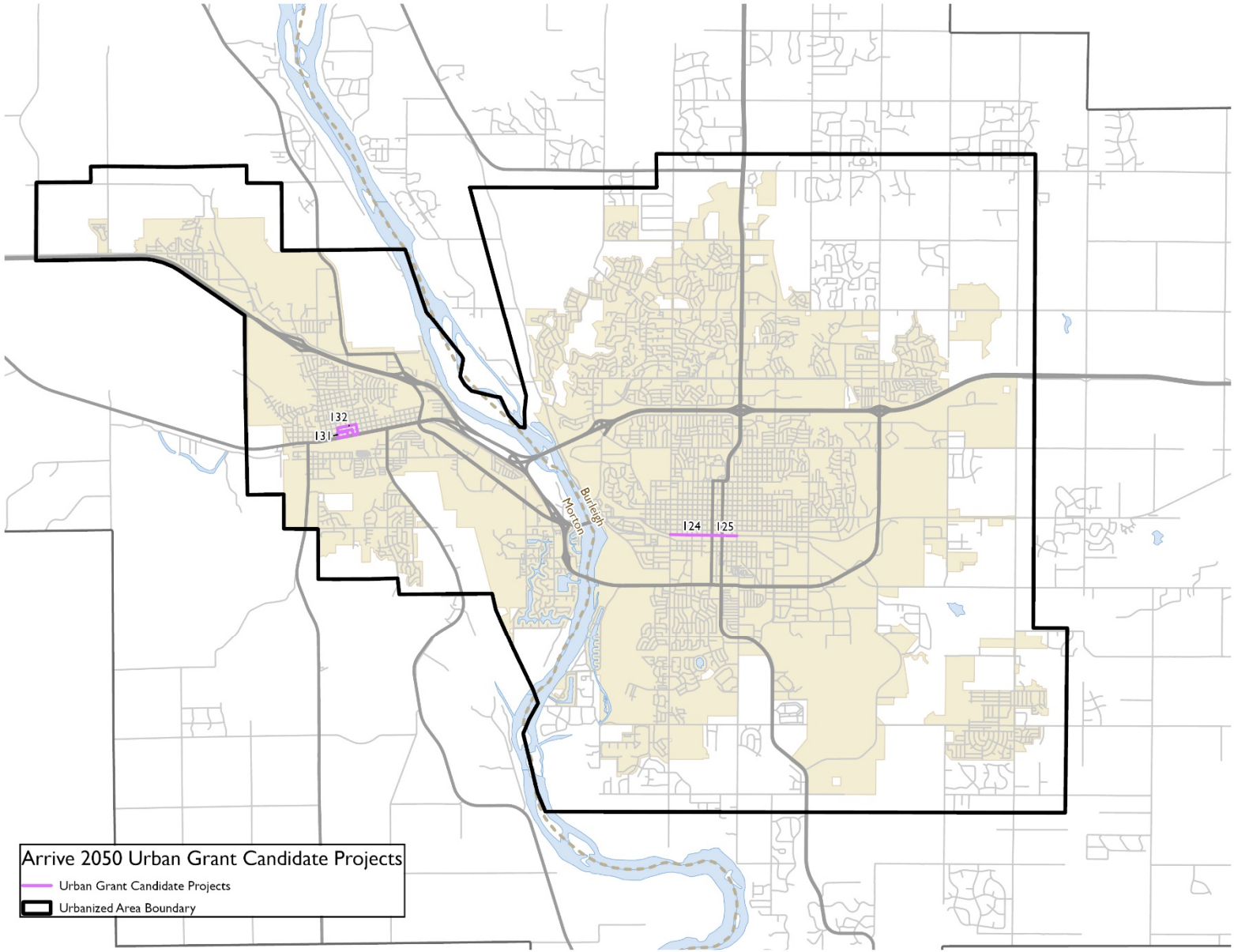
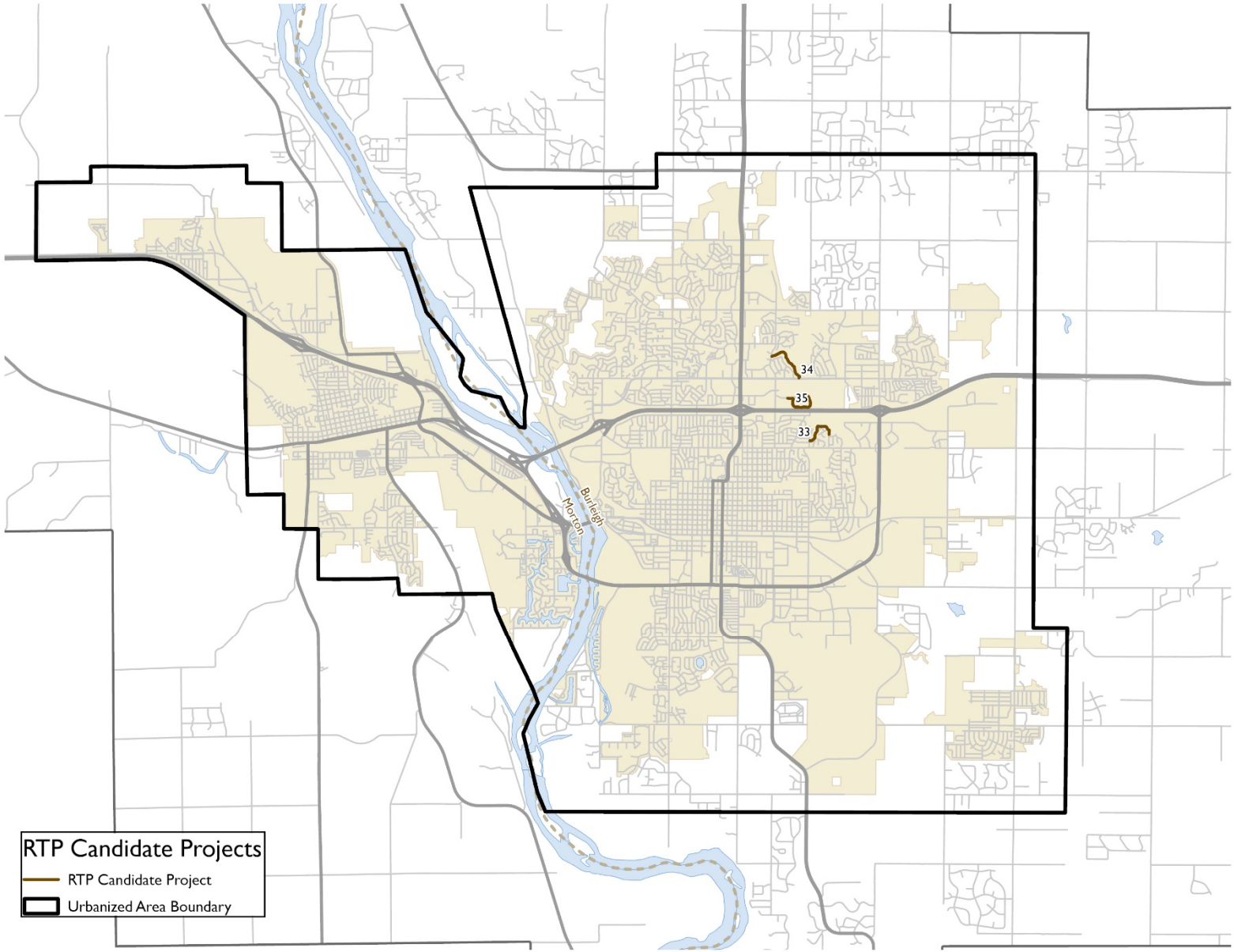


Figure 50: Arrive 2050 Recreational Trails Program Candidate Projects



Future Study List

The Arrive 2050 planning process has identified a range of potential studies and efforts to consider in the near future, including the following:

- **Possible Location for Passenger Rail Station(s):** This study would consider how a future Amtrak North Coast Hiawatha route would best be served by one or more local train stations.
- **Technical Review of a Beltway:** The concept of a beltway or ring-road has been considered in past studies. Much has changed in terms of development and travel patterns since those studies. New data and tools are also available to help re-evaluate and define the vision for a beltway facility or ring-route.
- **Regional Roundabout Guidelines:** This study would develop a locally tailored set of guidelines for roundabouts based on both local lessons learned, national best practices, and planning level assessments of where roundabouts make the most sense.
- **ITS Plan Update:** This plan would update the current ITS plan for Bismarck-Mandan, which was last updated in 2004. This ITS plan is used as a coordinated plan for identifying community needs and the potential ITS solutions that can be implemented.
- **McKenzie Extension Across the Heart River:** One of the most impactful transportation alternatives considered as a part of the Arrive 2050 update was the potential extension of McKenzie Avenue across the Heart River. This potential corridor would create a more direct connection for much of south Mandan by connecting McKenzie Avenue to ND 1806 from its current terminus just west of 34th Avenue SE (and potentially extending all the way to US 6).
- **40th NE Corridor Study:** This corridor study would evaluate potential street improvements and access concepts for this growing corridor in northwest Mandan.
- **Mandan Downtown Parking Study/Curb Management:** This study would help identify an overall approach to public parking in downtown Mandan and how to best manage the multiple demands on downtown curbsides (such as parking, deliveries, and transit access).
- **Mandan and Morton County Comprehensive Plan Updates**
- **North Washington Extension**
- **Hay Creek Greenway/Greenway Study**
- **Intra-Regional Cross-Area Travel Study:** This study would be a potential follow-up to the beltway technical review study and would look at the potential travel demand impacts on critical corridors like State Street with major regional investments like a beltway and the northern bridge crossing.

In addition to these future studies, the MPO and its partner agencies will continue to coordination with ongoing efforts with the Big Sky Passenger Rail Authority (BSPRA), on the effort to reinstate passenger rail service from Seattle to Chicago along the former North Coast Hiawatha line by 2032the passenger rail.

Environmental Mitigation

Projects included in Arrive 2050's Fiscally Constrained Plan underwent a spatial analysis to understand which projects have potential to benefit or impact disadvantaged populations and communities within the Bismarck-Mandan MPO region. The intent of this analysis was to reinforce Arrive 2050's alignment with federal metropolitan transportation planning requirements, including federal Metropolitan Transportation Planning Factors and Planning Emphasis Areas, as well as Arrive 2050's stated goal area of Equity and efforts to minimize impacts on disadvantaged populations.

Disadvantaged Populations/Communities: The MPO has considered appropriate data, indices, and screening tools to determine whether a specific community is disadvantaged based on a combination of variables that may include, but are not limited to, the following:

- Low income, high and/or persistent poverty
- High unemployment and underemployment
- Racial and ethnic segregation, particularly where the segregation stems from discrimination by government entities
- Linguistic isolation
- High housing cost burden and substandard housing
- Distressed neighborhoods
- High transportation cost burden and/or low transportation access
- Disproportionate environmental stressor burden and high cumulative impacts
- Disproportionate impacts from climate change
- Access to health care

It should be noted that more detailed assessments of how projects might affect wetlands, historic properties, park and recreation areas will be conducted for projects during later project development steps. At the current planning level, none of the fiscally constrained projects have any obvious impacts to these resources documented in Appendix C.

Arrive 2050's Fiscally Constrained Plan contains a range of multimodal transportation improvements, and these improvements can be categorized into two groups:

- **Expansion Projects:** Improvements that add new capacity to the region's transportation system. Examples include construction of a new roadways or widening of existing roadway facilities.
- **Rehabilitation Projects:** Improvements that address the condition of existing transportation infrastructure. Examples include reconstruction, mill and overlays, and concrete pavement repair.

In the context of equity in transportation, the terms "benefits" and "impacts" are used to categorize the externalities associated with transportation improvements. The analysis conducted to evaluate the distribution of Fiscally Constrained projects assumes expansion projects to be sources of potential impacts due to the potential to induce additional traffic volumes in the future, potential needs for additional right-of-way, and a potential reduction in traveler safety. Rehabilitation projects are not assumed to pose these same impacts.

This evaluation compared the Fiscally Constrained Plan projects to the following populations within the MPO region:

- **Low income**
- **Minority**
- **Limited English Proficiency**

Any expansion project whose full or partial extent was within a Census Block Group identified with any of the above populations was considered as having potential to impact those populations. Low-income areas have an average income under 200% of the federal poverty level.

A Block group that has a total minority population (which encompasses Black/African American, American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, Hispanic/Latino) that is 10 percentage points higher than the county average is considered a Minority Block group. A limited-English proficiency Block group is a population which speaks languages other than English by 5 percent of greater of the total population.

The resulting distribution of Fiscally Constrained projects and their potential to impact low income, minority, and limited English proficiency populations in the Bismarck-Mandan MPO are summarized in **Figure 51** through **Figure 53**.

Figure 51: Alternatives Distribution in Low Income Areas

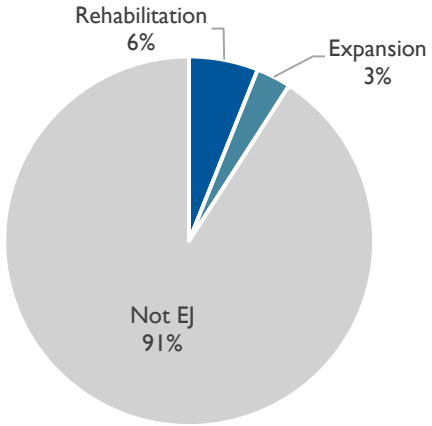


Figure 52: Alternatives Distribution in Minority Areas

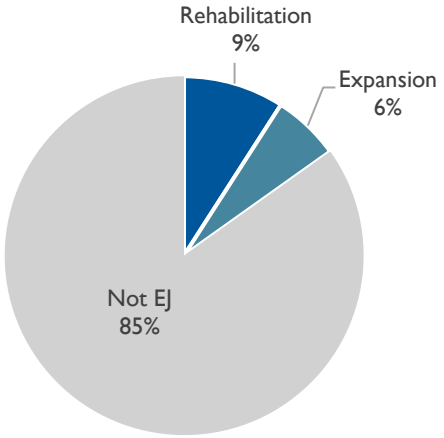
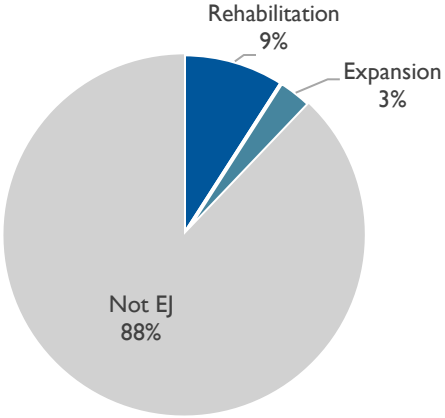


Figure 53: Alternatives Distribution in Limited English Areas



As described in the figures above, most alternatives will not have a substantial impact on EJ areas in the Bismarck-Mandan MPO area. The majority of alternatives located in EJ areas are classified as Rehabilitation projects (55 percent), with the remaining projects being Expansion (45 percent). Rehabilitation projects can improve the lifespan of the transportation network, without adding permanent disruptions to nearby populations, which will avoid negative impacts to any populations that may have been historically disadvantaged from transportation improvements. On the other hand, expansion projects may lead to disproportionate impacts on minority groups and create more permanent disruption such as pollution and noise to nearby neighborhoods, and any potential negative impacts of these projects should be further evaluated.

Assuming the rehabilitation projects will not cause any permanent negative impacts to surrounding neighborhoods, the highest proportion of an EJ population group to potentially face some temporary impacts is tied between Minority and Limited English populations (9 percent) in Bismarck-Mandan. Expansion projects that may result in more disruptions is found to have the highest potential impact on Minority populations, with 6 percent of projects being located near these populations. However, expansion projects only make up 3 percent of total projects identified in EJ areas. As noted in the baseline conditions chapter:

- 20 percent of the MPO population is considered low income.
- 14 percent of the MPO population are people of color/minorities.

Thus disruptive street projects do not appear to disproportionately impact low income and minority projects.

Bicycle and Pedestrian Benefits for EJ Areas

Bicycle and pedestrian projects can be considered as beneficial as they can provide alternative modes to transportation for low-income populations, as well as reduce noise and air pollution. **Figure 54** through **Figure 56** details whether expansion or rehabilitation bicycle and pedestrian projects are located in EJ areas. As shown in **Figure 54** and **Figure 55**, the largest benefit will be expansion of bicycle and pedestrian facilities through low-income areas, and minority areas. Thus, bicycle and pedestrian expansion projects are benefiting a higher proportion in both low-income areas (44% of projects vs 20% of the population) and minority areas (32% of projects vs 14% of the population).

Note that no bicycle and pedestrian maintenance projects are included in low-income areas or in minority areas.

Figure 54: Bicycle and Pedestrian Projects in Low-Income Areas

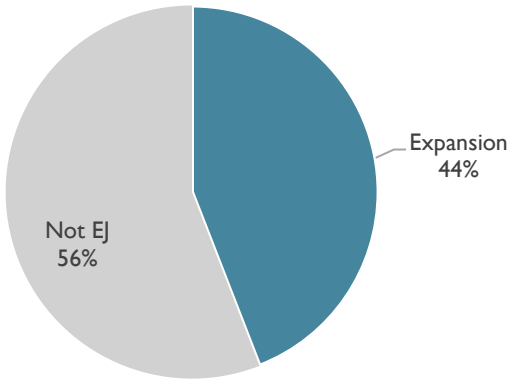


Figure 55: Bicycle and Pedestrian Projects in Minority Areas

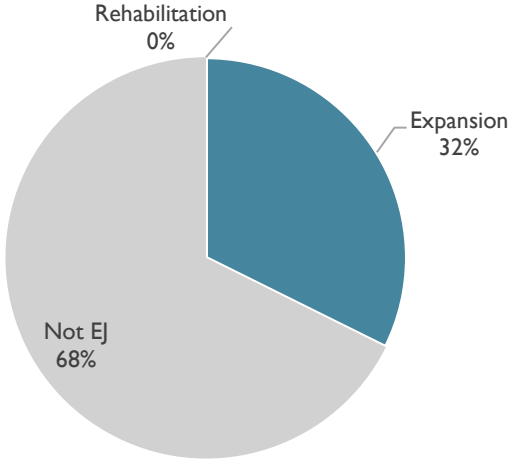
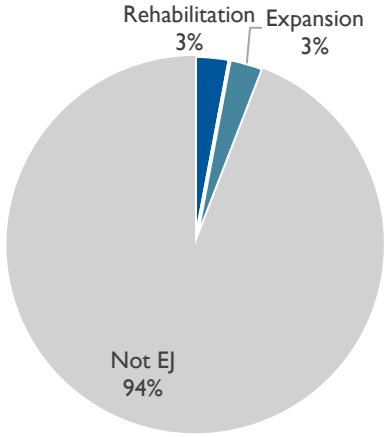


Figure 56: Bicycle and Pedestrian Projects in Limited English Areas



Federal Compliance

This MTP follows the guidelines set by 23 CFR § 450 Metropolitan Transportation Planning and Programming, which details the process for an MTP to be developed. MTPs are federally required to contain an outcome-based and performance-driven approach. This plan followed that approach throughout the planning process and provides objectives and performance measures that adhere to federal, state, and local requirements and goals.

There are 10 federal metropolitan transportation planning factors that were each considered throughout the development of goals and objectives of this plan:

1. Support economic vitality of the metropolitan area
2. Increase the safety of the transportation for motorized and non-motorized users
3. Increase the security of the transportation system for motorized and non-motorized users
4. Increase the accessibility and mobility of people and freight
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns
6. Enhance the integration and connectivity of the transportation system across modes for people and freight
7. Promote efficient system management and operation
8. Emphasize the preservation of the existing transportation system
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
10. Enhance travel and tourism

Table 45: Arrive 2050 Goal Area Alignment with Federal Metropolitan Transportation Planning Factors

Goal	Objectives	Economic Vitality	Safety	Security	Accessibility and Mobility for People and Freight	Environment and Energy Conservation, Quality of Life	System Integration and Connectivity for People and Freight	Efficient Operations and Management	Preserve the Existing System	System Resiliency and Reliability, Reduce or Mitigate Stormwater	Enhance Travel and Tourism
GOAL: SAFETY											
	Reduce crash frequency and severity		✓								
	Implement safe system features		✓								
	Speed reduction for vulnerable users		✓								
	Vision zero		✓								
GOAL: ECONOMIC											
	Safe and reliable freight	✓			✓			✓			
	Support other regional plans		✓		✓	✓	✓				
	Support efficient development patterns	✓				✓					✓
	Promote the efficient delivery of complementary multimodal improvements with roadway construction projects	✓			✓		✓				

Goal	Objectives	Economic Vitality	Safety	Security	Accessibility and Mobility for People and Freight	Environment and Energy Conservation, Quality of Life	System Integration and Connectivity for People and Freight	Efficient Operations and Management	Preserve the Existing System	System Resiliency and Reliability, Reduce or Mitigate Stormwater	Enhance Travel and Tourism
GOAL: RESILIENT											
	Minimize environmental impacts					✓				✓	
	Integrate multimodal design into new development				✓		✓				
	System security			✓							
	Reduce and/or mitigate VMT					✓					
GOAL: MAINTENANCE											
	Pavement and bridge condition								✓		
	Signage condition								✓		
	Bicycle and pedestrian system condition				✓				✓		
	Transit capital condition				✓				✓		
	Signal, lighting, and ITS condition								✓		
	Proactively manage pavement								✓		

Goal	Objectives	Economic Vitality	Safety	Security	Accessibility and Mobility for People and Freight	Environment and Energy Conservation, Quality of Life	System Integration and Connectivity for People and Freight	Efficient Operations and Management	Preserve the Existing System	System Resiliency and Reliability, Reduce or Mitigate Stormwater	Enhance Travel and Tourism
GOAL: FUTURE FOCUSED											
	ITS maintenance and planning				✓			✓			
	Manage the system through technology		✓	✓				✓			
	Plan for connected and autonomous vehicles		✓				✓	✓			
	Plan for electric vehicles	✓				✓	✓				✓
	Leverage data for decision-making			✓				✓			
GOAL: ACTIVE TRANSPORTATION AND TRANSIT											
	Transit coordination				✓						
	Implement transit and rideshare strategies				✓						
	Transit security			✓							
	Bicycle and pedestrian project implementation				✓						
	User education		✓		✓						
	Reduce multimodal gaps				✓	✓					

Goal	Objectives	Economic Vitality	Safety	Security	Accessibility and Mobility for People and Freight	Environment and Energy Conservation, Quality of Life	System Integration and Connectivity for People and Freight	Efficient Operations and Management	Preserve the Existing System	System Resiliency and Reliability, Reduce or Mitigate Stormwater	Enhance Travel and Tourism
	Multimodal coordination				✓	✓					
	Implement complete streets				✓	✓					
	Transit coordination				✓						
	Implement transit and rideshare strategies				✓						
GOAL: EQUITY											
	Connecting disadvantaged neighborhood				✓	✓					
	Proactive community engagement					✓					
	Minimize impacts on disadvantaged populations					✓					

Appendix A: Project Alignment with Regional Vision Scorecards and Scoring Rubric

Table 46: Project Report Card

Project ID	Location	Goals Met
1	Centennial Road	
2	43rd Avenue	
3	Century Avenue	
4	I-94	
5	17th Avenue	
6	Old Highway 10/E Main Avenue	
7	66th Street	
8	I-94	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
9	Apple Creek Road	
11	Lincoln Road	
12	Burleigh Avenue	
13	48th Avenue S	
14	66th Street	
15	66th Street	
16	66th Street	
18	52nd Street NE	
19	52nd Street	
21	Hamilton Street/Channel Drive	
22	Centennial Road	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
23	Bismarck Expressway/ Centennial Road	
24a	Divide Avenue	
24b	Divide Avenue	
25a	Main Avenue	
25b	Main Avenue	
26	Main Avenue	
27	E Main Avenue	
28	E Main Avenue	
29	E Main Avenue	
30	Bismarck Expressway	
31	Washington Street	
32	26th Street	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
33	N 19th Street	
34	N 19th Street	
35	57th Avenue	
36	43rd Avenue	
37	Calgary Avenue	
40	71st Street	
41	57th Avenue	
42	57th Avenue	
43	57th Avenue	
44	71st Avenue	
45	Centennial Road	
46	Centennial Road	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
47	43rd Avenue	
49	State Street	
50	State Street	
51	Burnt Creek Loop North/River Road	
52	State Street	
53	N 19th Street	
54	Tyler Parkway	
55	Apple Creek Road	
56	Ash Coulee Drive	
57	71st Avenue/ND 1804	
58	Tyler Parkway	
59	57th Avenue	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
61	57th Avenue	
62	57th Avenue	
63	66th Street SE	
64	76th Avenue SE	
65	Northern Bridge	
66	37th Street NW	
67	37th Street NW	
68	ND 1806	
69	38th Street NW	
70a	8th Avenue NW	
70b	8th Avenue NW	
71a	Sunset Drive	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
71b	Sunset Drive	
72a	37th Street NW	
72b	37th Street NW	
73	Division Street NE	
74	Sunset Drive	
75	Sunset Drive Corridor	
77	Old Red Trail	
78	Mandan Avenue	
80	Division Street	
81	Sunset Drive	
82	3rd Avenue NE	
84	ND 1806	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
85	19th Street SE	
86	McKenzie Drive	
87	McKenzie Drive	
88	McKenzie Drive	
89	56th Avenue	
90	Old Red Trail	
91	56th Avenue NW	
92	Boundary Road	
93	32nd Avenue W	
94	Boundary Road	
95	31st Street NW	
96	Division Street	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Project ID	Location	Goals Met
97	3rd Street SW	
98	Old Red Trail	
99	56th Avenue NW	
100	32nd Avenue	
101	3rd Street SW	
102	Main Avenue	
103	43rd Avenue N	
104	Burleigh Avenue	
105	27th Street	
106	71st Avenue NE	

Key	
	Safety
	Economic
	Resilient
	Efficiency and Reliability
	Maintenance
	Future Focused
	Active Transportation and Transit
	Equity

Table 47: Scoring Rubric for Evaluating 2050 Alternatives Alignment with Regional Vision

Goal Areas	Objectives	Possible Points
Safety	Reduce crash frequency and severity	7
	Implement safe system features	7
	Reduce speed for vulnerable users	6
	Vision zero	0
	Total Points	**20**
Economic	Safe and reliable freight	3
	Support other regional plans	2
	Support efficient development patterns	2
	Promote the efficient delivery of complementary multimodal improvements with roadway construction projects	3
	Total Points	**10**
Resilient	Minimize environmental impacts	2
	Integrate multimodal design into new development	0
	System security	1
	Reduce and/or mitigate VMT	2
	Total Points	**5**
Efficiency and Reliability	Promote reliable vehicle travel	8
	Limit recurring congestion	8
	Identify corridors that facilitate efficient regional travel	5
	Reduce single-occupant vehicle travel	4
	Total Points	**25**

Goal Areas	Objectives	Possible Points
Maintenance	Pavement and bridge condition	6
	Signage condition	0
	Bicycle and pedestrian system condition	0
	Transit capital condition	0
	Signal, lighting, and ITS condition	4
	Proactively manage pavement	0
	Total Points	**10**
Future Focused	ITS maintenance and planning	2
	Manage the system through technology	3
	Plan for connected and autonomous vehicles	0
	Plan for EVs	0
	Leverage data for decision-making	0
	Total Points	**5**
Active Transportation and Transit	Transit coordination	3
	Implement transit and rideshare strategies	0
	Transit security	0
	Bicycle and pedestrian project implementation	3
	User education	0
	Reduce multimodal gaps	3
	Multimodal coordination	0
	Implement complete streets	6
	Total Points	**15**

Goal Areas	Objectives	Possible Points
Equity	Connecting disadvantaged neighborhoods	5
	Proactive community engagement	0
	Minimize impacts on disadvantaged populations	5
	Total Points	**10**

Appendix B: Public and Stakeholder Engagement Summary

Appendix C: Existing Conditions Summary

ARRIVE 2050

METROPOLITAN
TRANSPORTATION PLAN

Baseline System Conditions

Baseline System Conditions

Introduction

The baseline conditions of the Bismarck-Mandan MPO's multi-modal transportation system were analyzed so that the issues and needs of the system could be identified. The identification of these existing issues and needs informs the development of the baseline scenario used to evaluate future multi-modal system scenarios, as well as the development of potential strategies available to the MPO in addressing these issues and needs.

This report summarizes the resulting analyses conducted for the multi-modal system, which reviewed existing safety, traffic operations, multi-modal, and asset conditions. A summary of identified multi-modal issues and needs identified through the baseline system analyses concludes the report.

Safety	Traffic Operations	Freight	Bicycle and Pedestrian	Transit System	Regional Connection	Asset Conditions

The MPO Area Today

A review of current demographic and employment data was conducted to gain an understanding of those residing and working within the MPO region. Through developing a demographic and employment profile of the community, the Bismarck-Mandan MPO can better understand the current transportation needs of residents and workers.

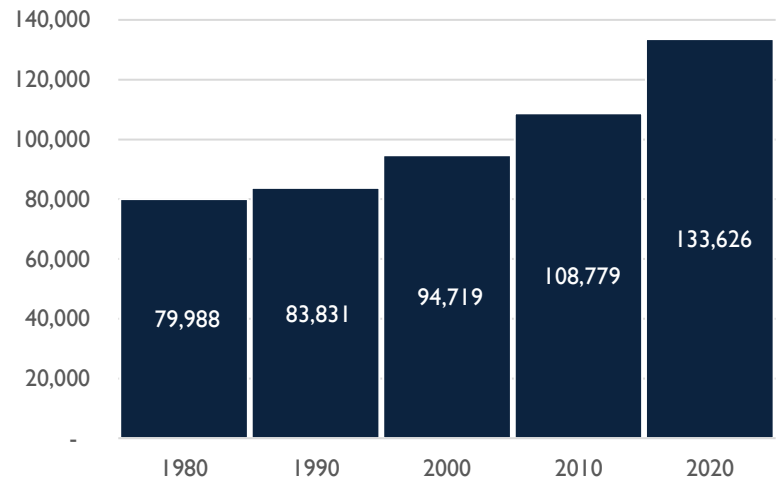
The demographic and employment data reviewed as part of this community profile was for the Bismarck-Mandan Metropolitan Area.

Historic Population Growth

Historic population levels for the Bismarck-Mandan Metropolitan Area were obtained from past U.S. decennial censuse23s to illustrate how the region has grown since 1980. **Figure 1** presents these historic population levels. **Figure 1** illustrates that the metro's population grew modestly between 1980 and 1990. By the year 2000, the population had grown by over 10,000 and growth continued to accelerate over the next two decades with the 2020 census recording a population of 133,626.

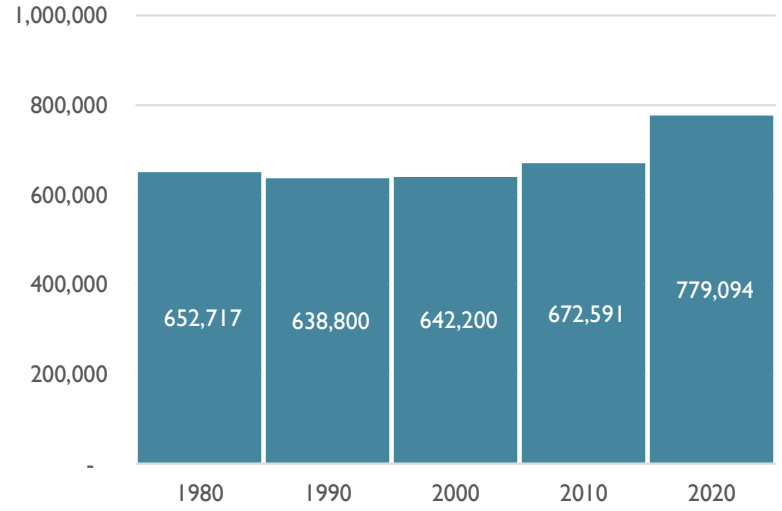
To provide a comparison of how the Bismarck-Mandan Metropolitan Area has grown over the past five decades, historic population levels for the State of North Dakota were also reviewed and are shown in **Figure 2**. The state's population experienced a decline between 1980 and 1990 before experiencing a slight increase in population by the year 2000. Since 2000, North Dakota's population has grown at a substantial rate which reflects the trend seen for the Bismarck-Mandan Metropolitan Area.

Figure 1: Population Growth for the Bismarck-Mandan Metropolitan Area, 1980 - 2020



Source: U.S. Decennial Census, 1980 – 2022

Figure 2: Population Growth for the State of North Dakota, 1980 - 2020



Source: U.S. Decennial Census, 1980 – 2022

Age

Age is an important factor in determining travel demand as different age groups have varying transportation needs. Data related to median age and proportions of the population aged 65 years or older were reviewed to identify the current trends related to these topics.

Median Age

Table 1 summarizes the current median age of residents in the Bismarck-Mandan Metropolitan Area and provides a comparison to the median age of residents across the state of North Dakota and the United States based on the American Community Survey (ACS) 1-year estimates for the year 2022.

The current median age for residents of the Bismarck-Mandan Metropolitan Area is 38.5 which is slightly higher than the median age of 36.2 for the state of North Dakota. Compared to the United States, the median age for both the metro area and the state is lower than that of the nation.

Percent of Population Over 65 Years of Age

The proportion of the population aged 65 years and older in the Bismarck-Mandan Metropolitan Area has grown since 2010 as illustrated in **Table 2**. In 2010, 13.5 percent of the metro area's population was 65 or older and this proportion grew to 16.3 percent in 2020. A similar trend was observed for the state of North Dakota as well as the United States for this same period, which highlights an overall shift towards an older population.

Table 1: Median Age for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and United States, 2022

Median Age	
Bismarck-Mandan Metropolitan Area	38.5
State of North Dakota	36.2
United States	39.0

Source: American Community Survey 1-Year Estimates, 2022

Table 2: Percent of the Population Over 65 Years of Age for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and United States

Percentage of Population Over 65 Years	2010	2015	2020
Bismarck-Mandan Metropolitan Area	13.5%	14.6%	16.3%
State of North Dakota	14.6%	14.2%	15.3%
United States	12.8%	14.8%	16.1%

Source: American Community Survey 5-Year Estimates, 2010 - 2020

Housing

Housing characteristics are an additional demographic indicator that is related to travel demand. The average household sizes for the Bismarck-Mandan Metropolitan Area, the state of North Dakota, and the United States were identified based on ACS 1-year estimates for the year 2022 and are shown in **Table 3**. It was found that the average household size for the Bismarck-Mandan Metropolitan Area is 2.38 for owner-occupied households and 2.07 for renter-occupied households; the resulting average household size is 2.23. Compared to the state of North Dakota, the average household size is slightly larger than the state's average of 2.19. Households across the United States are larger on average than those of both the metro area and the state of North Dakota.

Table 3: Average Household Size for the Bismarck-Mandan Metropolitan Area, State of North Dakota, and the United States

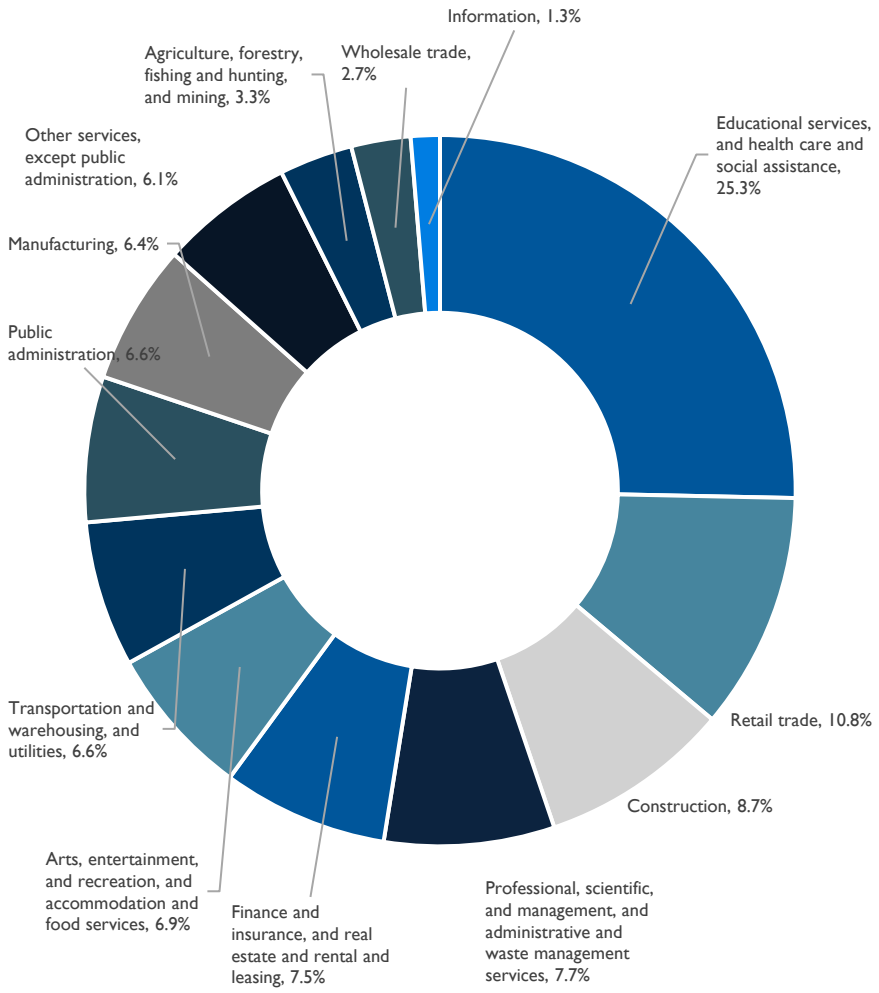
Average Household Size	Owner-Occupied	Renter-Occupied	Average
Bismarck-Mandan Metropolitan Area	2.38	2.07	2.23
State of North Dakota	2.42	1.96	2.19
United States	2.63	2.27	2.45

Source: American Community Survey 1-Year Estimates, 2022

Employment

Data on employment by industry for the Bismarck-Mandan Metropolitan Area is summarized in **Figure 3**. The largest proportion of workers, at 25.3 percent, in the metro area are employed in educational services, health care, and social assistance. The retail trade employs the second largest proportion of workers at 10.8 percent while the construction industry employs almost 9 percent of the metro area's workers.

Figure 3: Employment by Industry for the Bismarck-Mandan Metropolitan Area



Source: American Community Survey 1-Year Estimates, 2022

Commuting

Commuting trends for workers within the Bismarck-Mandan Metropolitan Region were analyzed based on ACS 1-year estimates for the year 2022 so that a profile of modal share, time of departure, and travel time to work could be developed.

Means to Work

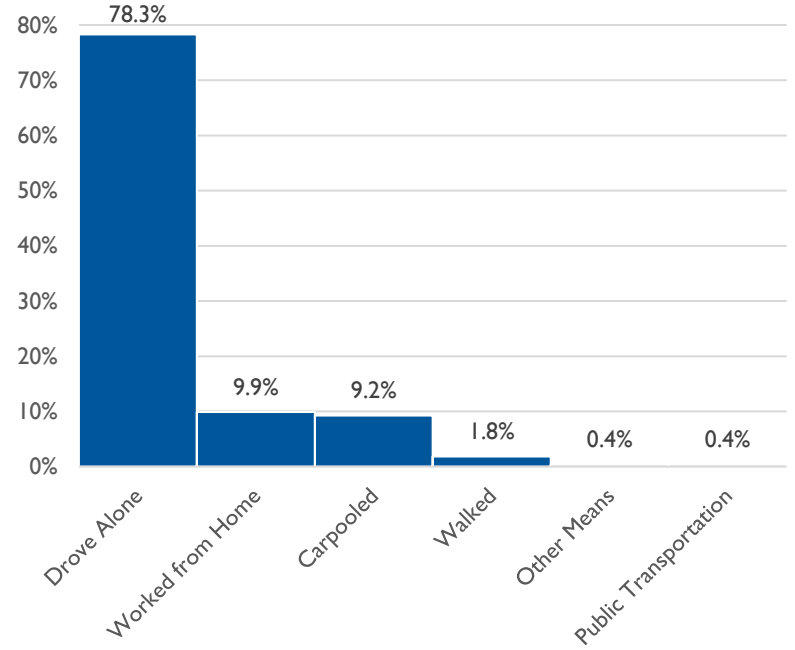
Means to work refers to the primary transportation mode used by workers for commuting purposes. **Figure 4** provides a summary of the current modal share for the metro area's workers.

Approximately 78 percent of workers in the metro area drive alone during their commute while an additional 9.2 percent carpool; this indicates that over 87 percent of workers commute to work via automobile each day. **Nearly 10 percent of metro area workers are reported as working from home which marks a significant increase in the proportion of workers who worked from home in 2019, which was reported as 3.2 percent.**

This increase marks a trend in working arrangements that began with the COVID-19 public health pandemic in 2020 that saw a major shift in the number of individuals working from home due to local shelter-in-place ordinances. Since 2020, the number of workers with a work from home arrangement has declined when compared to the numbers reported during the pandemic but are still above pre-COVID-19 levels.

Of the remaining commuting modes, roughly 2 percent of metro area workers are estimated to walk to work, while 0.4 percent use public transportation, and the remaining 0.4 percent use other means for their commute.

Figure 4: Means of Commuting to Work for the Bismarck-Mandan Metropolitan Area



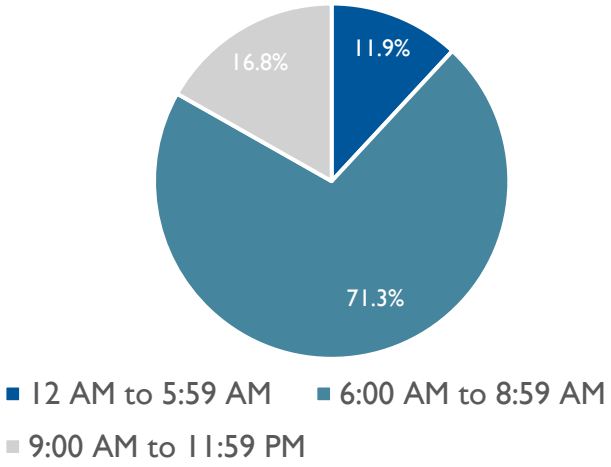
Source: American Community Survey 1-Year Estimates, 2022

Time of Departure

Time of departure refers to the hour with which workers begin their commutes. This measure provides insight into when peak period travel times likely occur as peak travel is typically associated with the morning and afternoon commute period.

Figure 5 illustrates the current breakdown of times of departure for metro area works. As the figure shows, over 70 percent of the metro area's commutes depart home between the hours of 6 AM and 8 AM. The second largest proportion of commutes begin between the hours of 9 AM and 11 PM. Almost 12 percent of commutes depart from between the hours of 12 AM and 5 AM.

Figure 5: Time of Departure to Work for the Bismarck-Mandan Metropolitan Area



Source: American Community Survey 1-Year Estimates, 2022

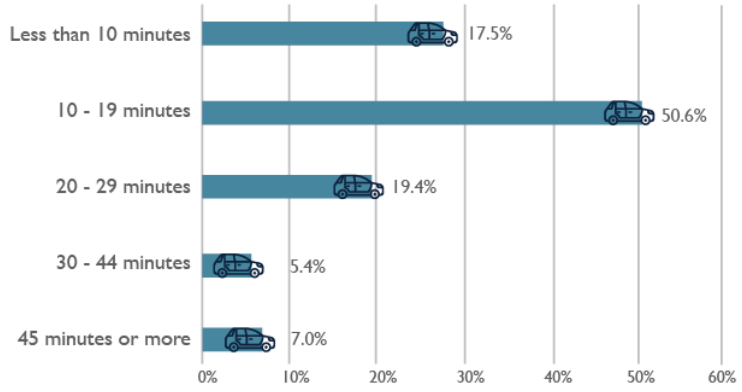
Travel Time to Work

Travel time to work looks at the length of commutes in terms of minutes to provide a picture of how long a worker typically spends commuting to their place of employment. **Figure 6** summarizes the travel times for the metro area's workers.

The largest share of commuters, 26.3 percent, spend between 15 to 19 minutes traveling to work while 24.3 percent spend between 10 and 14 minutes. The third largest share of workers typically spend less than 10 minutes commuting to work.

Commutes beyond 25 minutes are not common for workers in the Bismarck-Mandan Metropolitan Area but it is noted that 5 percent of workers commute 60 or more minutes to their place of employment.

Figure 6: Travel Time to Work for the Bismarck-Mandan Metropolitan Area
Source: American Community Survey 1-Year Estimates, 2022



Commuting Inflow/Outflow

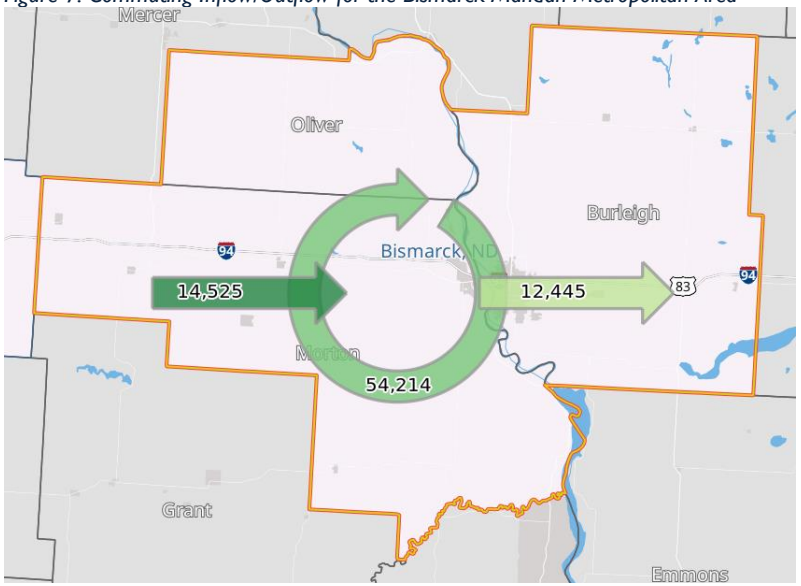
Commuting inflow/outflow is an analysis that looks at commuting flows into, out of, and within a defined area. A commuting inflow/outflow analysis was conducted for the Bismarck-Mandan Metropolitan Area so that commuting flow patterns for the region's workers could be identified.

The results of the analysis are shown in **Figure 7**. Of the nearly 69,000 workers employed within the Bismarck-Mandan Metropolitan Area, 54,214 are reported as both living and working within the metro area while approximately 12,445 individuals employed within the metro area live outside of it. The remaining 14,525 of the metro area's workers are reported as living outside the metro but commute into the area for their jobs.

Data related to the top commuting corridors within the MPO Area was collected from Replica HQ, which is a platform that integrates location-based data from mobile devices with land use and ACS demographic data to estimate travel in a geographic area via an activity-based travel demand model. The Replica data was filtered to private auto trips taken to work locations within the MPO Area during a typical weekday in Spring 2023.

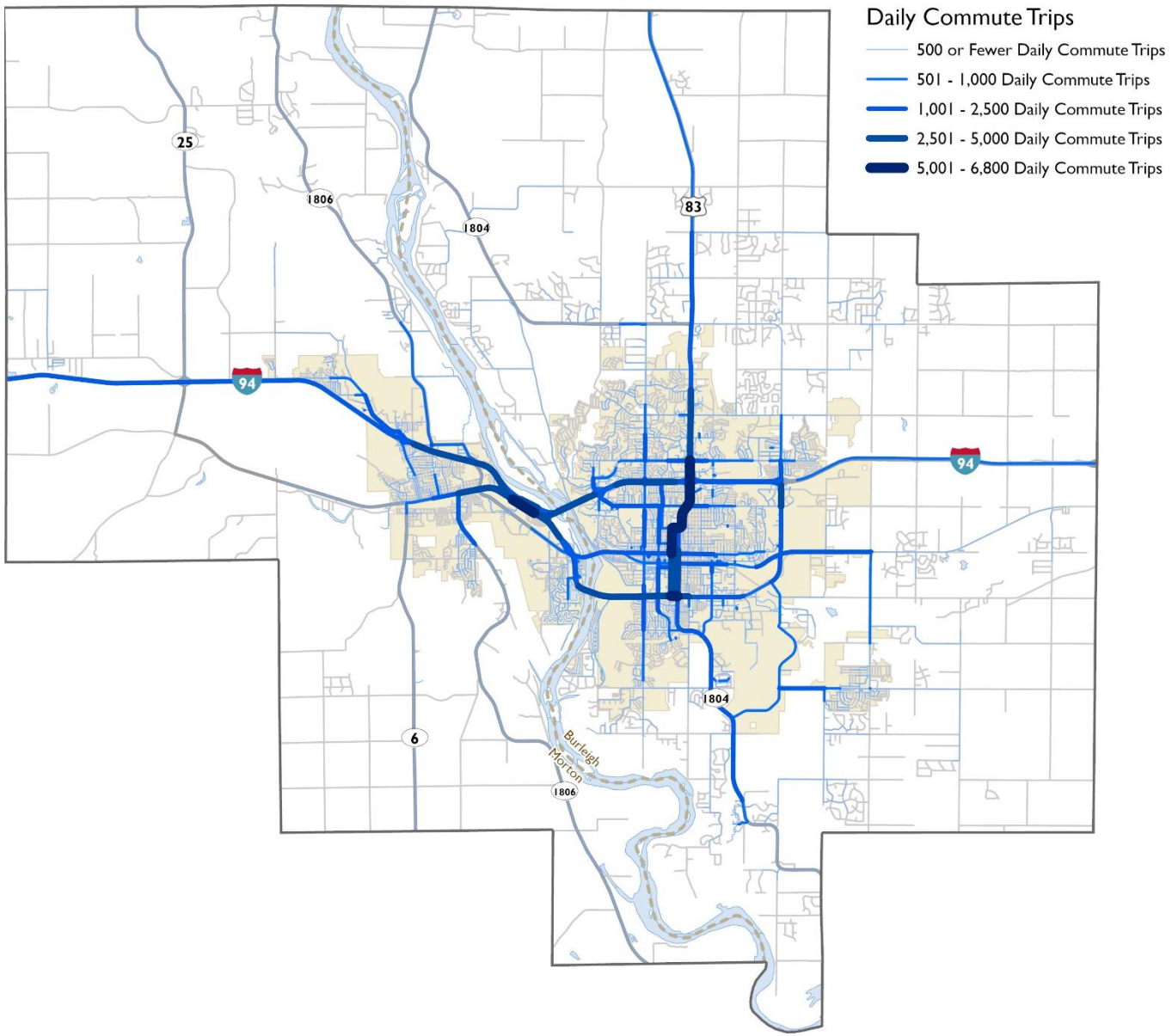
Figure 8 shows the resulting number of commute trips on a typical weekday for the MPO Area. As Figure X shows, the major corridors used for commuting trips include I-94 in Bismarck and Mandan, and US 83 within Bismarck. Overall, the MPO's functionally classified system was shown to carry the majority of commute trips as most corridors are estimated to facilitate at least 1,000 commute trips on a typical weekday.

Figure 7: Commuting Inflow/Outflow for the Bismarck-Mandan Metropolitan Area



Source: United States Census Bureau, *OnTheMap*

Figure 8: Top Commuting Corridors in the MPO Area



MPO Area Street and Highway Network

The streets and highways of the Bismarck-Mandan MPO area are the central feature of the multi-modal transportation system. Facilitating mobility and access to regional residential, employment, and recreational destinations, the MPO's streets and highways are a critical element in supporting the region's development and economy.

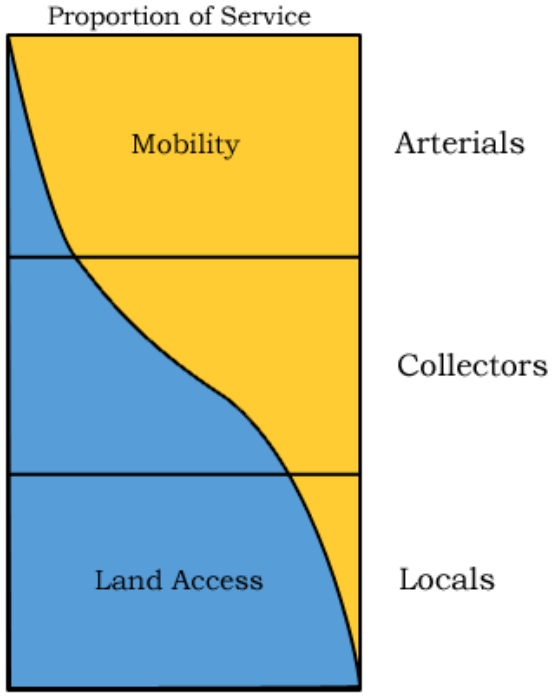
This section of the report summarizes the current classifications of the MPO's streets and highways, including Federal functional classifications, National Highway System (NHS) designations, and the jurisdictions responsible for the maintenance and operation of these roadways.

Functional Classifications

Functional classifications are a series of designations used to classify streets and highways based on the character of service provided by them. The purpose of assigning roadways a functional classification is to organize the network so that the proper balance between mobility and accessibility is provided to road users, as demonstrated in **Figure 9**. High mobility roadways typically are designed to carry higher daily traffic volumes at higher speeds with limited access, while roadways are designed to provide higher degrees of accessibility carrying lower daily traffic at lower speeds so that adjacent land uses can be easily accessed.

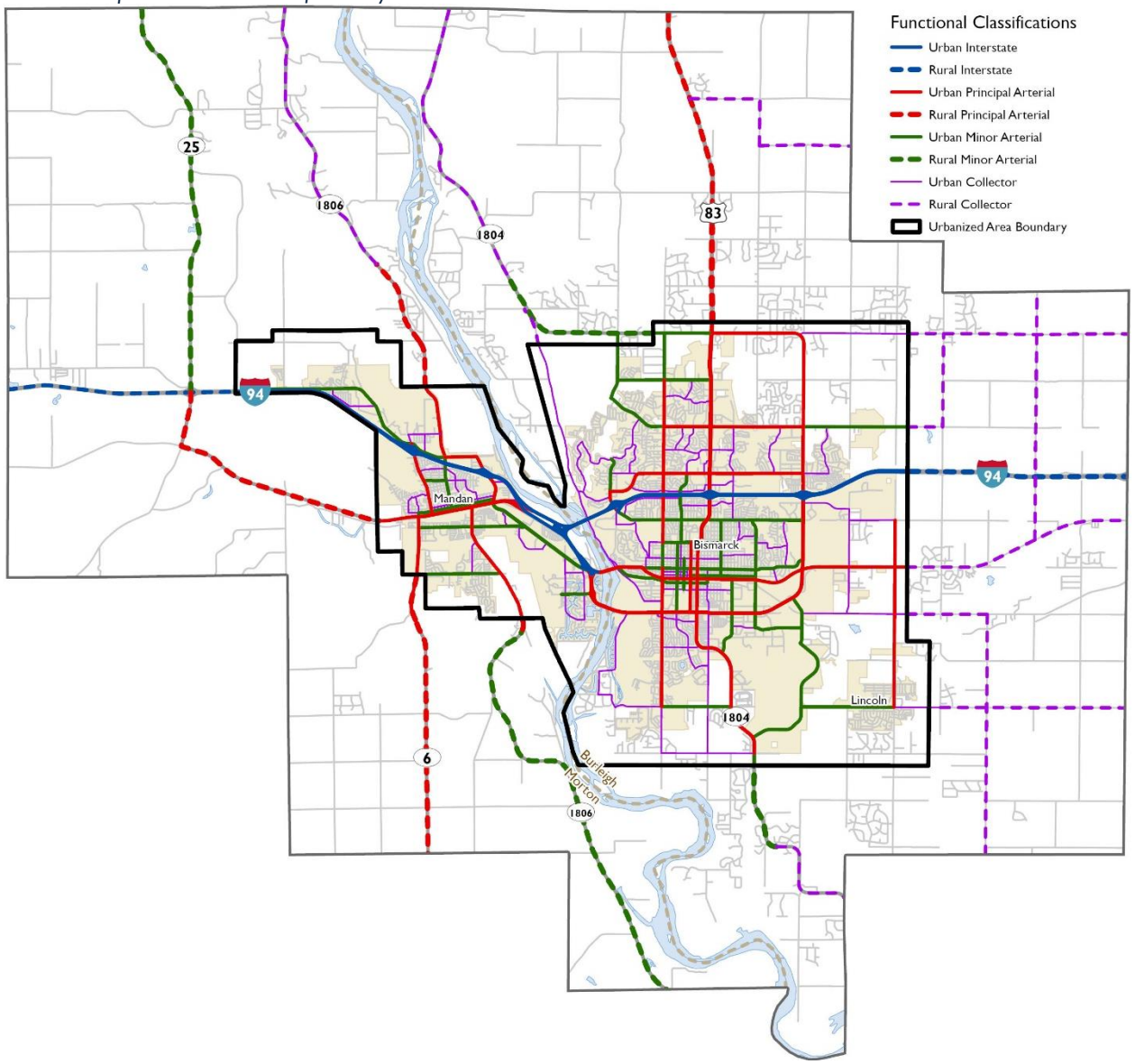
In addition to the balance of mobility and accessibility provided by the functional classification system, the Federal Highway Administration (FHWA) uses functional classifications for planning purposes. Roadways identified under the Federal functional classification system are considered part of the Federal-aid system, meaning they are eligible to receive Federal funding for transportation-related improvements. The MPO area's proposed Federal functional classification system is delineated between urban and rural functional classifications, which are determined based upon the MPO's urbanized area boundary (UZA); MPO roadways that fall within the UZA are considered urban, while those outside of the UZA are considered rural. The MPO's proposed functionally classified system and UZA are shown in **Figure 10.**

Figure 9: Accessibility and Mobility Characteristics of the Functionally Classified Roadway System



Source: Federal Highway Administration

Figure 10: Bismarck-Mandan MPO's Proposed Functional Classification System



Source: Bismarck-Mandan MPO, Burleigh County, North Dakota Department of Transportation

National Highway System

The National Highway System (NHS) is a network of roadways that are deemed as critical to the nation's economy, defense, and mobility. This network was developed through cooperation between the United States Department of Transportation (USDOT), states, local governments, and MPOs and consists of a series of subsystems, including:[1]

- **Interstate:** The Eisenhower Interstate System of Highways.
- **Other Principal Arterials:** Highways in rural and urban areas which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- **Strategic Highway Network (STRAHNET**): Network of highways which are important to the United States strategic defense policy, and which provide defense access, continuity, and emergency capabilities for defense purposes.
- **Major Strategic Highway Network Connectors:** Highways which provide access between major military installations and highways which are part of STRAHNET.
- **Intermodal Connectors:** Highways that provide access between major intermodal facilities and the other four subsystems of the NHS.

Designation as part of the NHS has planning implications for the roadways identified as part of this network. Eligibility for funds under certain Federal funding programs require NHS designation while Federal performance reporting requirements are based on each state's NHS segments.

The MPO's roadways designated as part of the NHS are shown in **Figure 11**.

Roadway Jurisdiction

Roadway jurisdiction pertains to the primary agency responsible for the maintenance and operation of a roadway. For the Bismarck-Mandan MPO area, jurisdictions responsible for roadways include state, county, township, and local agencies. Within the MPO area, the specific agencies responsible for maintaining and operating roadways include:

- **State Agencies**: North Dakota Department of Transportation (NDDOT)
- **County Agencies**: Burleigh and Morton Counties
- **Townships**: Hay Creek, Gibbs, and Apple Creek
- **Local Agencies**: Bismarck, Mandan, and Lincoln

Figure 12 shows the MPO area's roadways and their current jurisdictional responsibilities.

[1] Federal Highway Administration, *National Highway System*

Figure 11: National Highway System within the Bismarck-Mandan MPO Region

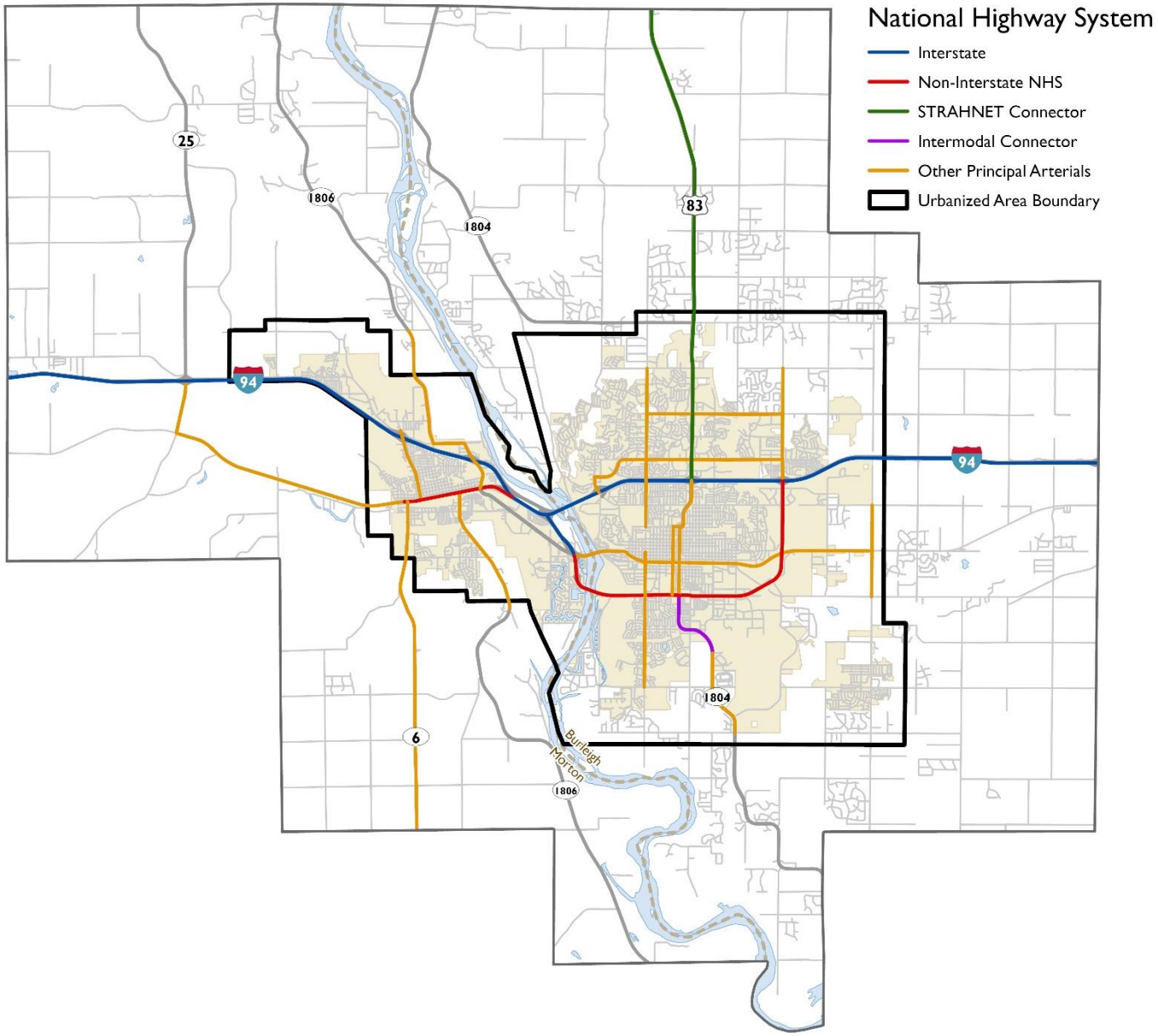
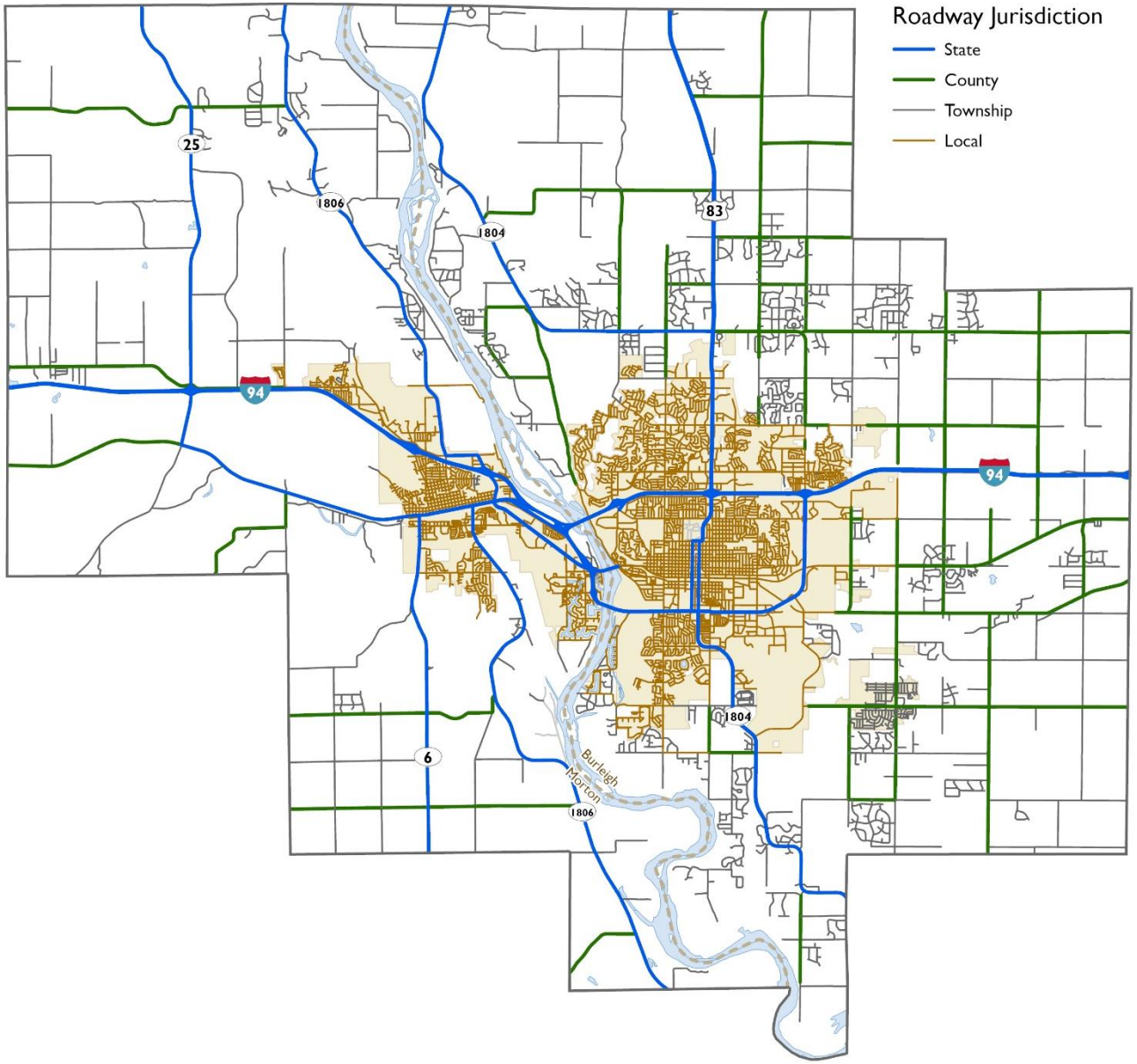


Figure 12: Bismarck-Mandan MPO's Roadway Jurisdictions



Safety

Multi-modal safety conditions for the Bismarck-Mandan MPO area were analyzed through a review of historic crash data. The data spans the years 2018 through 2022 and was sourced from NDDOT.

Annual Crash Trends

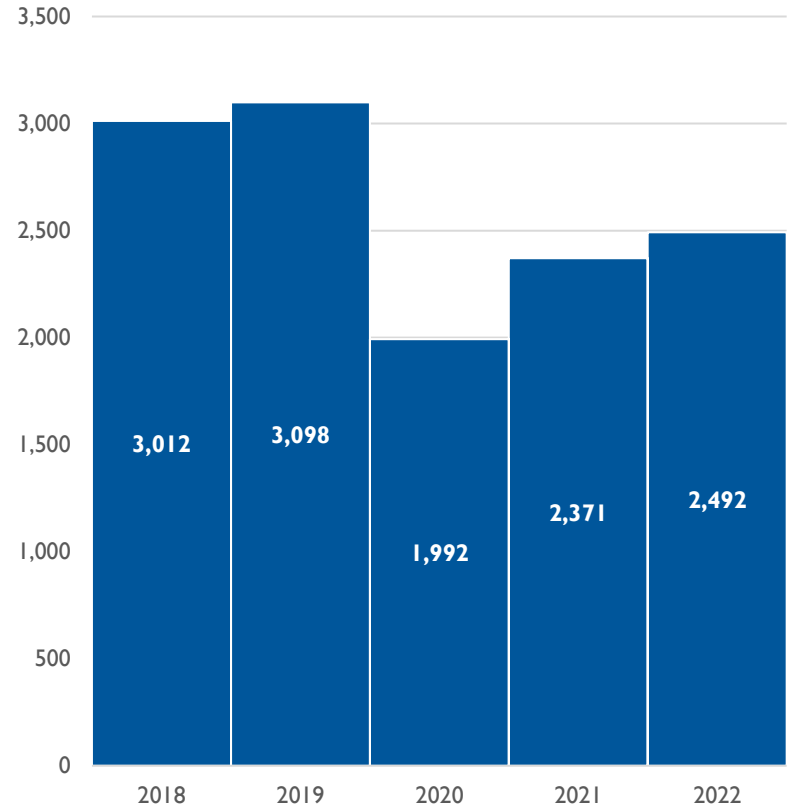
Annual crashes occurring in the MPO area between 2018 and 2022 are shown in **Figure 13**.

Several events occurred during the crash analysis period that impacted the annual trends shown in **Figure 13**:

- NDDOT revised the reporting requirements of Property Damage Only Crashes (PDO) in 2019, increasing the threshold for reporting from $1,000 in damage to $4,000 in damage.
- The COVID-19 pandemic in 2020 saw some local shelter-in-place activities that reduced travel, thereby lowering the number of vehicle miles traveled (VMT) during this period. The reduction in VMT resulted in fewer overall crashes.

As **Figure 13** demonstrates, annual crashes within the MPO for the years 2018 and 2019 exceeded 3,000 and saw a slight increase from 2018 to 2019. The year 2020 saw a reduction in crashes to just 2,000 and this was mainly attributed to reduced travel associated with the COVID-19 public health pandemic. Annual crashes experienced increases in both 2021 and 2022 as travel patterns began returning to pre-COVID levels. However, the revision in reporting requirements for PDO crashes exhibited fewer annual crashes for these years when compared to 2021 and 2022.

Figure 13: Annual Crashes within the MPO Area, 2018-2022



Source: North Dakota Department of Transportation Data

Crash Timing

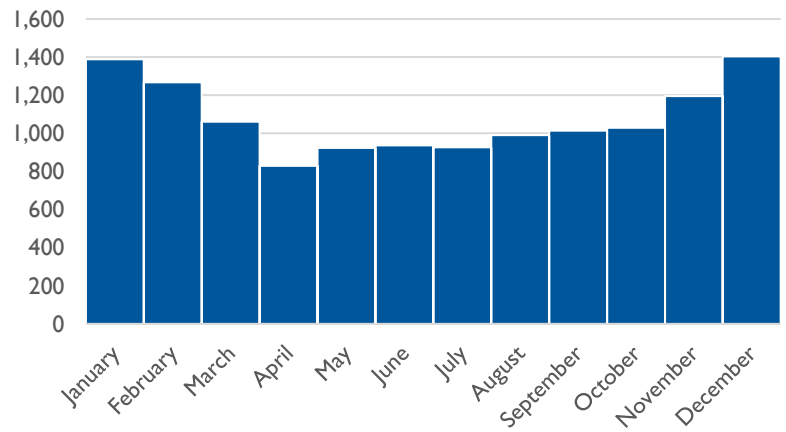
Crash timing analyzes when crashes occurred so that temporal factors influencing crash events can be identified. For the purposes of this baseline safety analysis, crash timing reviewed crashes by month and crashes by day of the week.

Crashes by Month

Through reviewing the timing of crash events on a monthly basis, an understanding of seasonal patterns that could be influencing crashes can be gained. Winter weather conditions can be especially impactful on safety due to the accumulation of snow and ice on roadways.

Figure 14 illustrates historic crashes by month for the MPO Area. Based on the crash data sourced from NDDOT, winter months were associated with higher occurrences of crash events. The months of January, February, November, and December exhibited the highest levels of crashes which was likely due to winter weather and low light conditions that impacted safety conditions for motorists.

Figure 14: Crashes by Month, 2018 - 2022

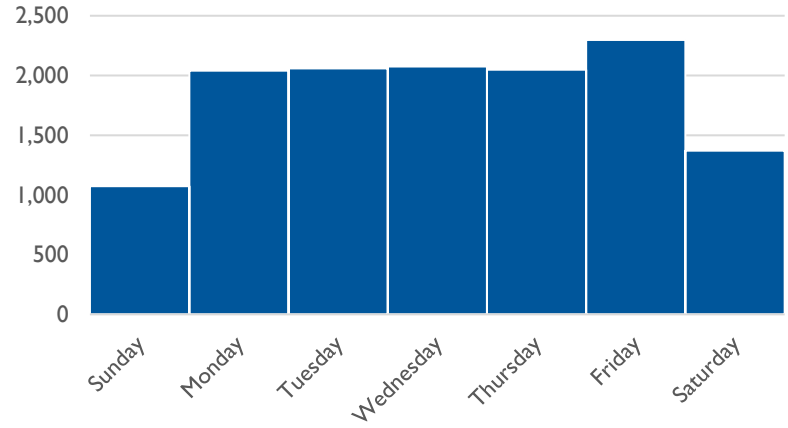


Source: North Dakota Department of Transportation Data

Crashes by Day of Week

The observed trend for historic crashes by day of the week is shown in **Figure 15**. As **Figure 15** illustrates, weekdays recorded the highest frequencies of crash events with Fridays recording the highest level of crashes. Weekend days were shown to record lower frequencies of crashes. Sundays were identified as the day of the week that recorded the lowest level of crashes.

Figure 15: Crashes by Day of Week, 2018 - 2022



Source: North Dakota Department of Transportation Data

Crash Severity

Crash severity refers to the most severe injury sustained by an individual as a result of a crash event. Currently, NDDOT uses five categories when determining crash severity:

- Fatal crash
- Serious injury crash (also referred to as Incapacitating Injury)
- Minor injury crash (also referred to as Non-Incapacitating Injury)
- Possible injury crash
- Property damage only (PDO)

Understanding the types of crashes that have occurred in the MPO area in terms of severity can help inform the development of strategies and safety countermeasures that can be implemented to reduce crash severities and improve the overall safety of the multi-modal system.

Table 4 summarizes crash severities by year for the MPO region. Between 2018 and 2022, there were 32 fatal crashes that occurred within the region; fatal crashes peaked in 2020 when a total of 9 occurred. Serious injury crashes demonstrated a general increase each year between 2018 and 2022 and totaled 209 during the analysis period. Minor injury and possible injury crashes totaled 1,241 and 1,342, respectively while PDO crashes were the most common severity with 10,141 recorded between 2018 and 2022.

Figure 16 provides more look at the annual trends related to fatal and serious injury crashes between 2018 and 2022. As the figure demonstrates, both fatal and serious injury crashes increased during the 5-year analysis period. The key takeaway from the figure is the sharp increase in serious injury crashes as this crash severity rose from a 2018 level of 32 to a high of 52 in both 2021 and 2022.

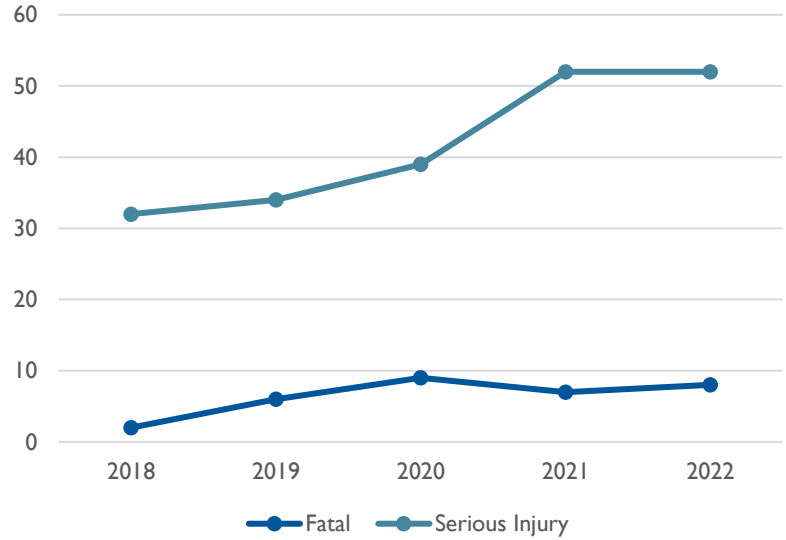
Figure 17 shows the locations of fatal and serious injury crashes that occurred in the MPO Area between 2018 and 2022.

Table 4: Crashes by Severity, 2018 - 2022

Year	Fatal	Serious Injury	Minor Injury	Possible Injury	PDO	Total
2018	2	32	197	328	2,453	3,012
2019	6	34	233	329	2,496	3,098
2020	9	39	212	238	1,494	1,992
2021	7	52	287	258	1,767	2,371
2022	8	52	312	189	1,931	2,492
Total	32	209	1,241	1,342	10,141	12,965

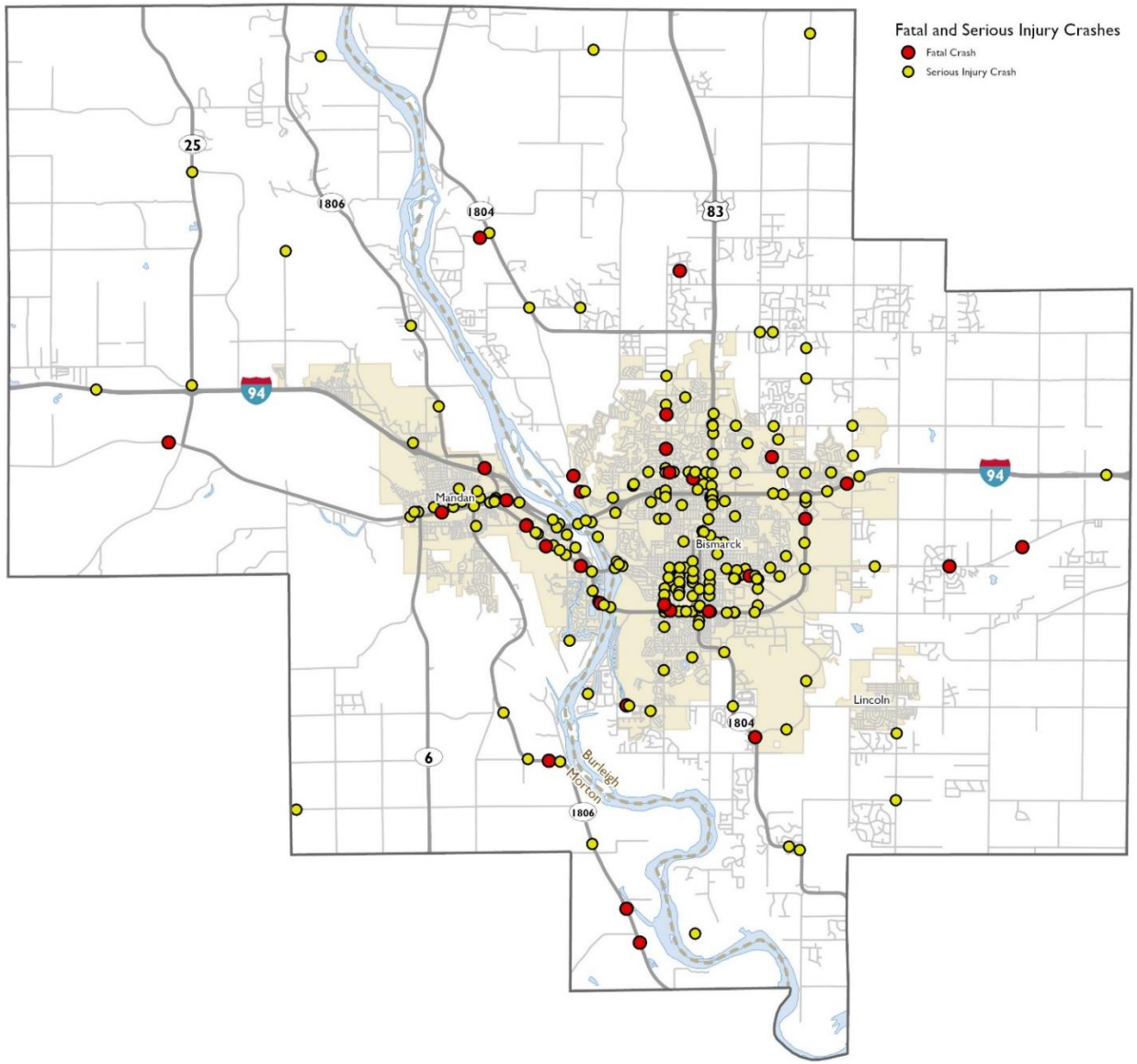
Source: North Dakota Department of Transportation Data

Figure 16: Annual Fatal and Serious Injury Crashes in the MPO Area, 2018 - 2022



Source: North Dakota Department of Transportation Data

Figure 17: Fatal and Serious Injury Crashes, 2018 - 2022



Source: North Dakota Department of Transportation Data

Manner of Crash

Manner of crash refers to the way two vehicles come together in a crash event, such as a rear-end or head-on collision. Similar to crash severity, an understanding of the manner in which crashes occur can inform the development of strategies and safety countermeasures at high crash frequency or high crash rate locations.

Table 5 shows the manner of crash trends observed for the MPO region between 2018 and 2022. Rear end crashes were the most common and accounted for roughly 33 percent of all crashes. Angle, single vehicle, and sideswipe (same direction) were also common types of crashes that occurred within the MPO during the analysis period.

Table 5: Manner of Crash, 2018 - 2022

Manner of Crash	2018	2019	2020	2021	2022	Total
Rear End	1,019	1,051	636	831	754	4,291
Angle	749	822	550	611	742	3,474
Single Vehicle	814	810	548	603	625	3,400
Sideswipe (same direction)	254	254	173	194	226	1,101
Head On	95	72	50	74	80	371
Rear to Side	45	45	13	26	27	156
Sideswipe (opposite direction)	26	33	17	26	33	135
Rear to Rear	10	11	5	6	5	37
Total	3,012	3,098	1,992	2,371	2,492	12,965

Source: North Dakota Department of Transportation

Intersection Crash Frequency

An intersection crash frequency analysis reviews intersection-related crashes so that they can be tied to specific locations within a study area. This analysis is a useful approach for identifying high-crash locations that can be considered candidates for safety improvements.

The intersection crash frequency analysis conducted for this baseline conditions report reviewed crashes occurring within a 250-foot radius of each intersection; all crashes occurring within that radius were assumed to be associated with that specific intersection. To supplement the intersection crash frequency in a manner consistent with NDDOT's approach to identifying high-crash urban and rural intersections, intersection polygons developed by NDDOT for urban arterial roadways were incorporated to select rear-end crashes associated with these intersections in addition to crashes occurring within the 250-foot buffer. Once the intersection-related crashes were associated with an intersection location, the top 20 were identified as shown in **Table 6;** intersections that were identified in NDDOT's 2019-2021 urban high crash location list are highlighted in light blue. **Figure 18** and **Figure 19** show the locations of the top 20 crash frequency intersections.

Intersection Crash Rates

Intersection crash rates build off the intersection crash frequency analysis described above by integrating entering volumes and calculating a crash rate per one million entering vehicles. This approach refines the crash frequency analysis by taking into account exposure, which normalizes crash events to reduce the influence of higher volume intersections. The crash rates and entering volumes used to calculate the rates for the top 20 crash frequency intersections are included in **Table 6**. **Table 7** summarizes crash severities for the top crash frequency intersections.

Table 6: Top 20 Crash Frequency Intersections

Rank	Intersection	Crash Frequency	Entering Volume	Crash Rate*
1	State Street & Century Avenue	174	50,000	1.91
2	Main Avenue & 9th Street	136	23,000	3.20
2	State Street & 43rd Avenue N	136	35,000	2.11
4	State Street & Interstate Avenue	131	42,000	1.69
5	Main Avenue & 7th Street	115	24,000	2.64
6	Bismarck Expressway & 9th Street / University Drive	114	33,000	1.89
7	State Street & Divide Avenue	105	35,000	1.66
8	Bismarck Expressway & 3rd Street	103	33,000	1.71
8	Bismarck Expressway & Washington Street	103	39,000	1.46
10	Bismarck Expressway & Miriam Avenue	100	29,000	1.87
11	State Street & Calgary Avenue	86	38,000	1.25
12	State Street & Capitol Avenue	82	32,000	1.39
13	Washington Street & Divide Avenue	80	22,000	2.00
14	Bismarck Expressway & 7th Street	77	23,000	1.84
15	Washington Street & Rosser Avenue	74	21,000	1.91
15	Century Avenue & Washington Street	74	26,000	1.55
17	State Street & Weiss Avenue / Harvest Lane	72	39,000	1.02
17	State Street & I-94 EB Ramps	72	41,000	0.96
19	7th Street & Rosser Avenue	70	20,000	1.90
19	State Street & Interchange Avenue	70	33,000	1.15

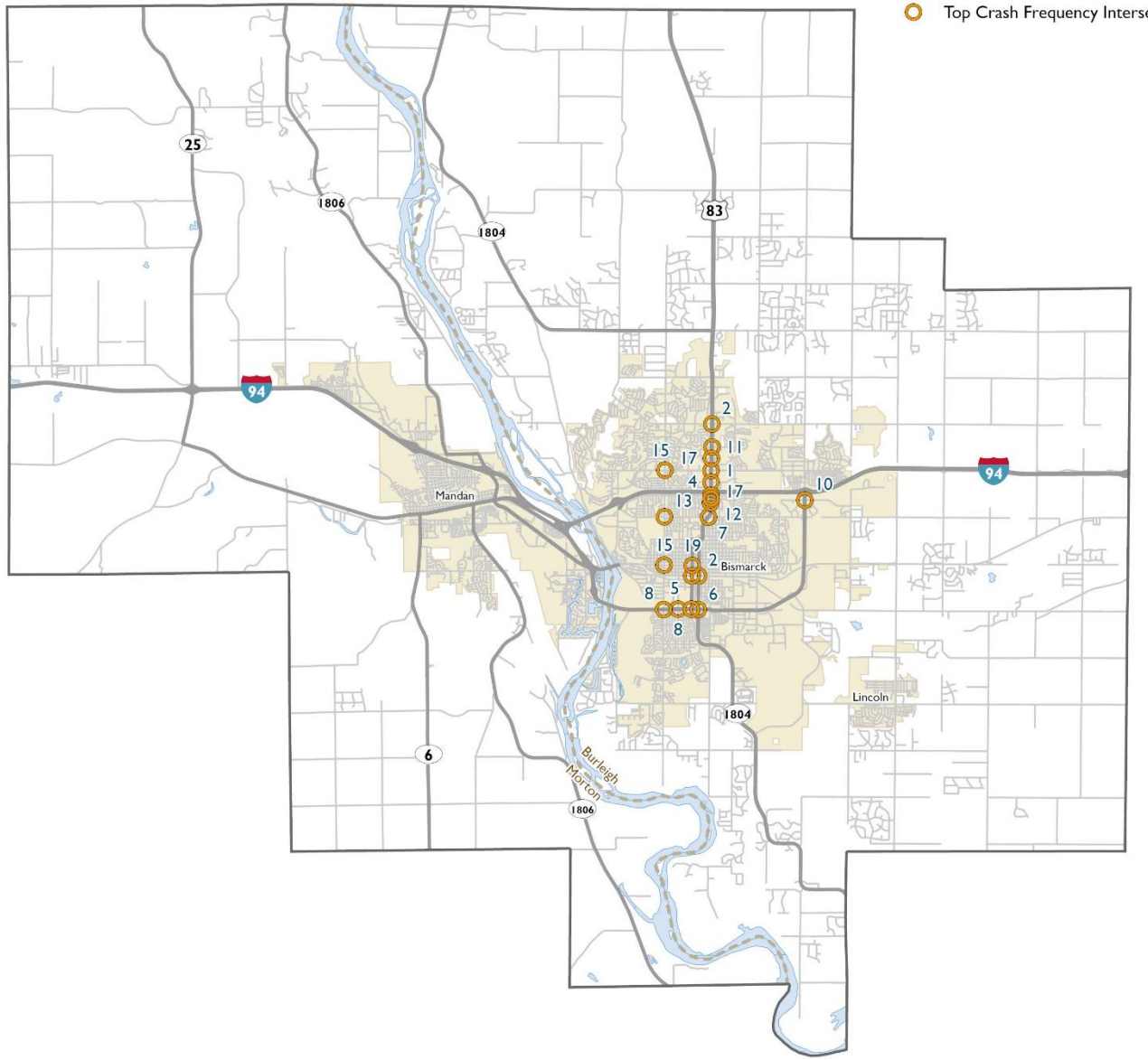
*Per Million Entering Vehicles

Table 7: Crash Severities for the Top 20 Crash Frequency Intersections

Rank	Intersection	Fatal	Serious Injury	Minor Injury	Possible Injury	PDO	Total
1	State Street & Century Avenue	0	1	11	23	139	174
2	Main Avenue & 9th Street	0	0	12	18	106	136
2	State Street & 43rd Avenue N	0	3	24	26	83	136
4	State Street & Interstate Avenue	0	1	9	22	99	131
5	Main Avenue & 7th Street	0	3	11	12	89	115
6	Bismarck Expressway & 9th Street / University Drive	0	0	9	13	92	114
7	State Street & Divide Avenue	0	1	9	16	79	105
8	Bismarck Expressway & 3rd Street	0	2	7	22	72	103
8	Bismarck Expressway & Washington Street	0	1	12	16	74	103
10	Bismarck Expressway & Miriam Avenue	0	2	4	23	71	100
11	State Street & Calgary Avenue	0	0	9	12	65	86
12	State Street & Capitol Avenue	0	1	9	10	62	82
13	Washington Street & Divide Avenue	0	1	6	13	60	80
14	Bismarck Expressway & 7th Street	0	1	5	12	59	77
15	Washington Street & Rosser Avenue	0	0	7	13	54	74
15	Century Avenue & Washington Street	0	1	5	8	60	74
17	State Street & Weiss Avenue / Harvest Lane	0	0	9	8	55	72
17	State Street & I-94 EB Ramps	1	1	7	8	55	72
19	7th Street & Rosser Avenue	0	0	4	10	56	70
19	State Street & Interchange Avenue	0	1	10	8	51	70

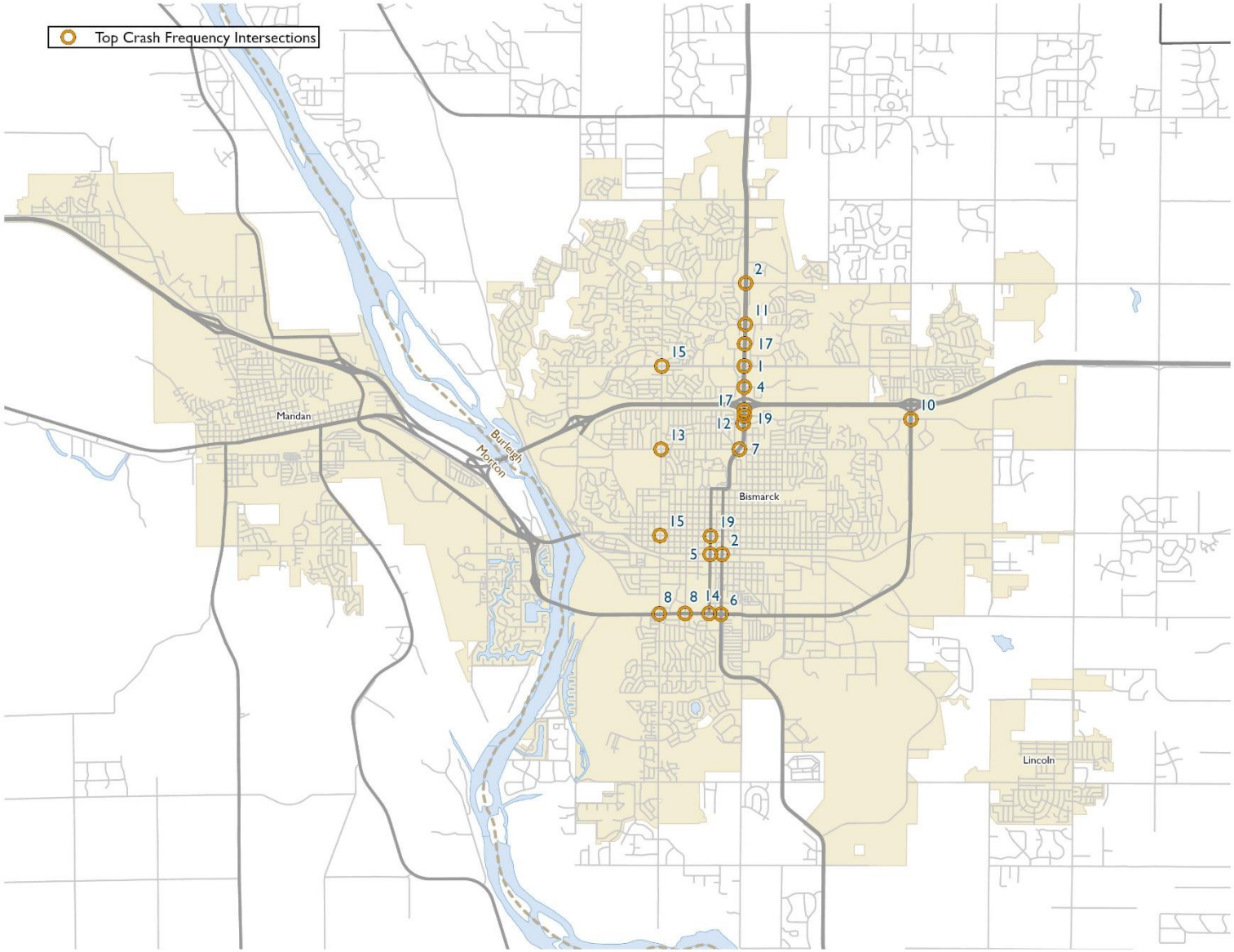
Source: North Dakota Department of Transportation

Figure 18: Top 20 Crash Frequency Intersections in the Bismarck-Mandan MPO Area, 2018 - 2022



Source: North Dakota Department of Transportation Data

Figure 19: Top 20 Crash Frequency Intersections (2018 - 2022), Urban Inset



Source: North Dakota Department of Transportation Data

Bicycle and Pedestrian Safety Conditions

While the previous safety analyses relate to vehicle-related crashes, it is important to understand safety conditions for non-vehicle users including bicyclists and pedestrians. Through identifying areas of concern for bicycle and pedestrian user safety, a multi-modal view of the transportation system can be retained. This section of the report presents the findings of bicycle and pedestrian safety conditions for the MPO area, including historic bicycle and pedestrian crash trends and bicycle- and pedestrian-involved fatal and serious injury crashes.

Historic Bicycle and Pedestrian Crashes

Historic bicycle and pedestrian crashes that occurred within the MPO area are summarized by year in **Table 7**while the locations of these crashes are shown in **Figure 20.**

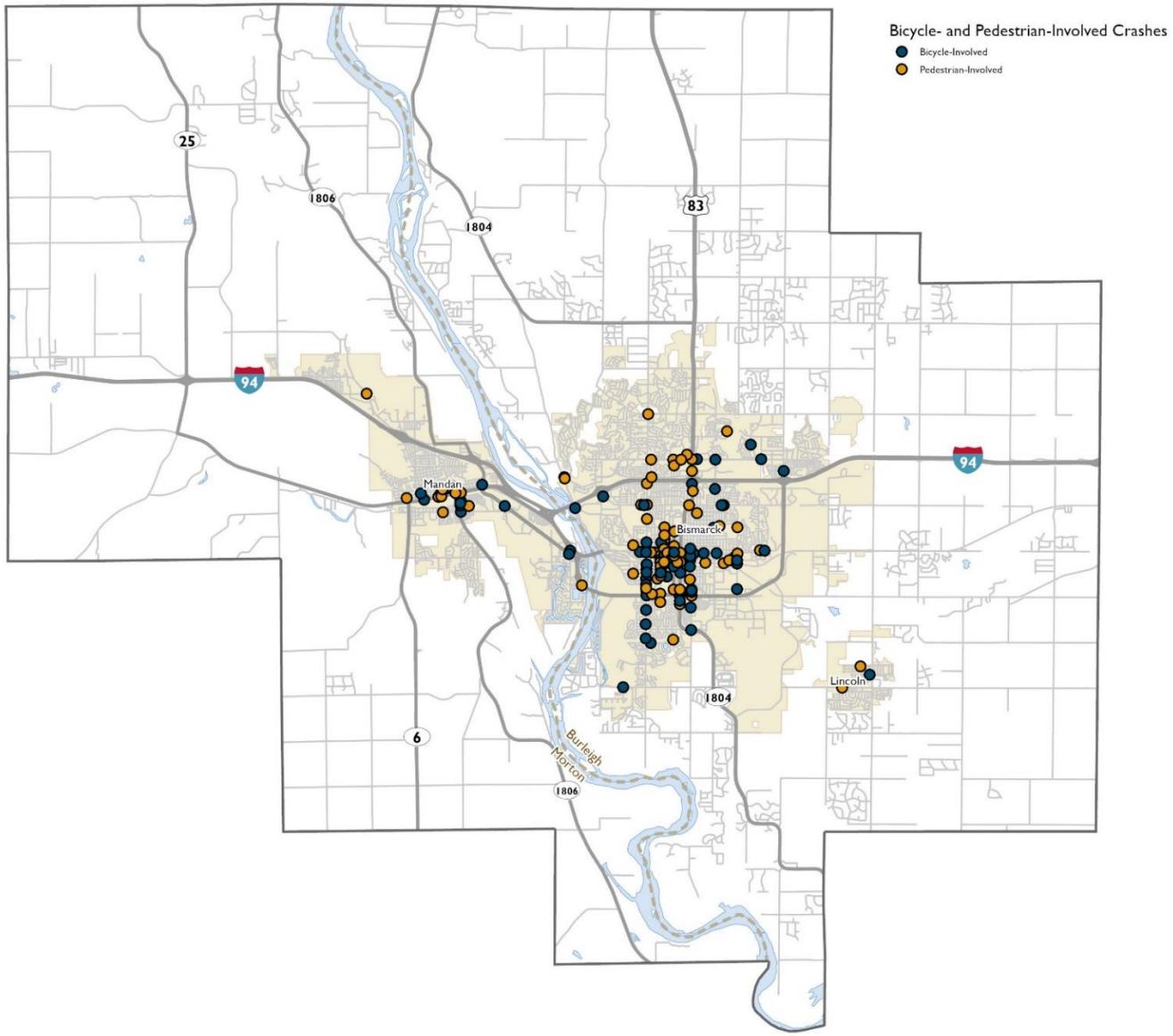
Bicycle-involved crashes saw a decrease each year from 2018 through 2022, with a total of 78 crashes recorded during these five years. Pedestrian-involved crashes followed a similar trend, peaking in 2018 with 23 crashes and exhibiting a general decline each year between 2018 and 2022. A total of 89 pedestrian-involved crashes occurred within the MPO area

Table 8: Bicycle- and Pedestrian-Involved Crashes, 2018 - 2022

Type	2018	2019	2020	2021	2022	Total
Bicycle-Involved	20	16	15	14	13	78
Pedestrian-Involved	23	22	15	20	9	89
Total	43	38	30	34	22	167

Source: North Dakota Department of Transportation Data

Figure 20: Bicycle- and Pedestrian-Involved Crashes, 2018 - 2022



Source: North Dakota Department of Transportation Data

Bicycle- and Pedestrian-Involved Fatal and Serious Injury Crashes

Table 8 summarizes fatal and serious injury crashes that involved bicyclists and pedestrians while **Figure 21** shows the locations of these crashes within the MPO area.

A total of six fatal crashes involving a bicyclist or pedestrian were reported between 2018 and 2022. Only one of these fatal crashes involved a bicyclist and occurred in 2019, while five pedestrian-involved fatal crashes occurred between 2020 and 2022.

Serious injury crashes involving a bicyclist or pedestrian totaled 26, with 10 of these crashes classified as bicycle-involved and 16 classified as pedestrian-involved. Bicycle-involved serious injury crashes peaked in 2020, when four serious injury crashes were reported. The year 2021 saw the highest level of pedestrian-involved serious injury crashes which totaled seven.

Table 9: Bicycle- and Pedestrian-Involved Crashes Fatal and Serious Injury Crashes, 2018 - 2022

Type	2018	2019	2020	2021	2022	Total
Fatal						
Bicycle-Involved	0	1	0	0	0	1
Pedestrian-Involved	0	0	1	2	2	5
Serious Injury						
Bicycle-Involved	2	1	4	3	0	10
Pedestrian-Involved	1	4	2	7	2	16

Source: North Dakota Department of Transportation Data

Vehicle-Train Crashes

Safety is a critical concern for locations where roadways intersect railroads at-grade. Collisions between vehicles and trains typically result in more severe crashes due to the momentum of trains colliding with a smaller automobile. The United States Department of Transportation (USDOT) has recognized the safety issues related to at-grade rail crossings and authorized over $570 million in discretionary grant funding for eliminating grade crossings as part of the IIJA.

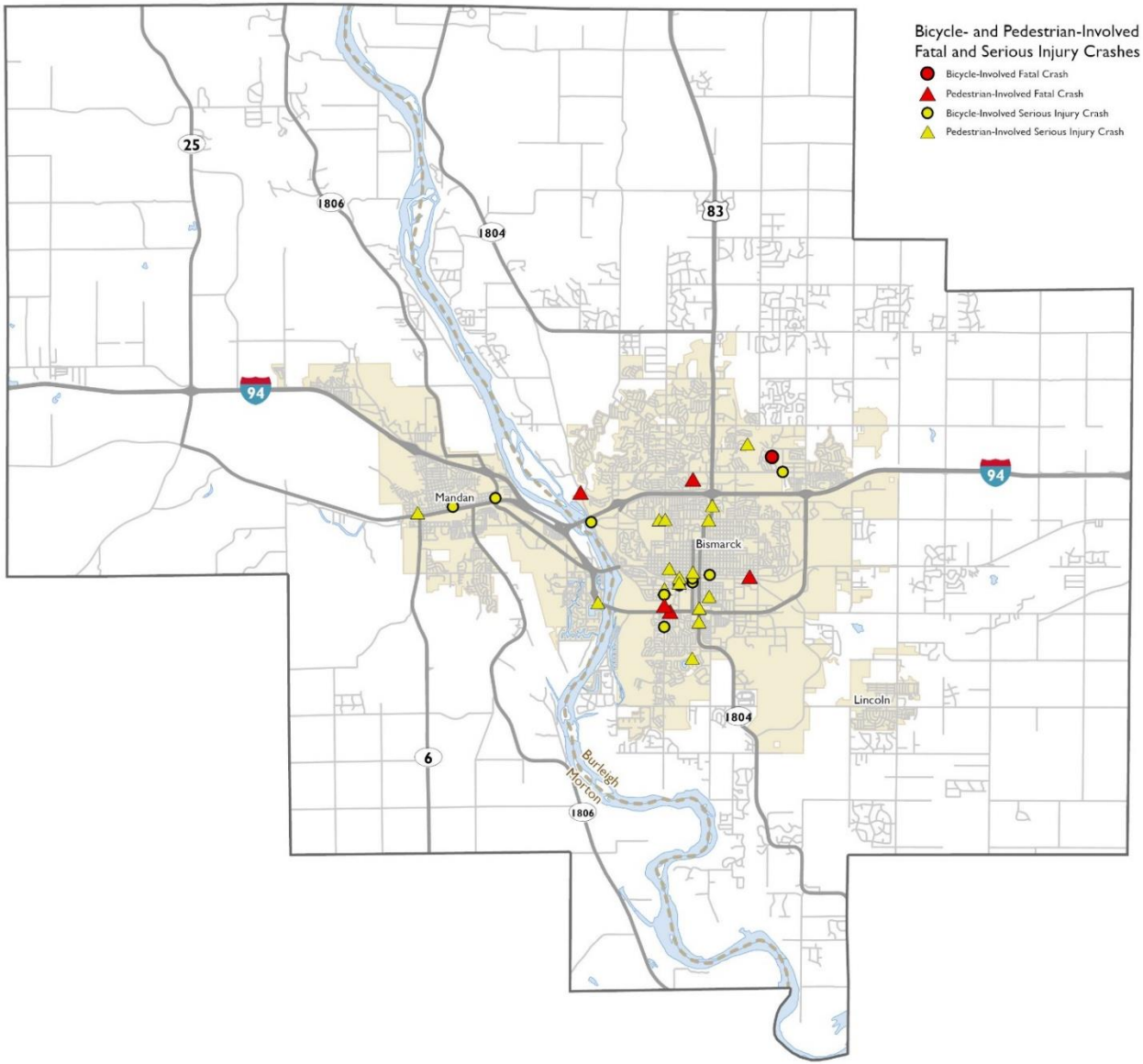
Within the Bismarck-Mandan MPO Area, collisions between vehicles and trains were reviewed based on NDDOT's crash data for the years 2018 through 2022. An analysis of the data found that two vehicle-train collisions were recorded during these five years; **Figure 22** shows where these crashes occurred within the MPO Area while **Table 9** details each of the crash events.

Table 10: Vehicle-Train Crashes in the Bismarck-Mandan MPO Area, 2018 - 2022

Location	Crash Severity	Year
S 5th Street and BNSF (City of Bismarck)	Property Damage Only	2018
31st Street and BNSF (Morton County)	Serious Injury	2022

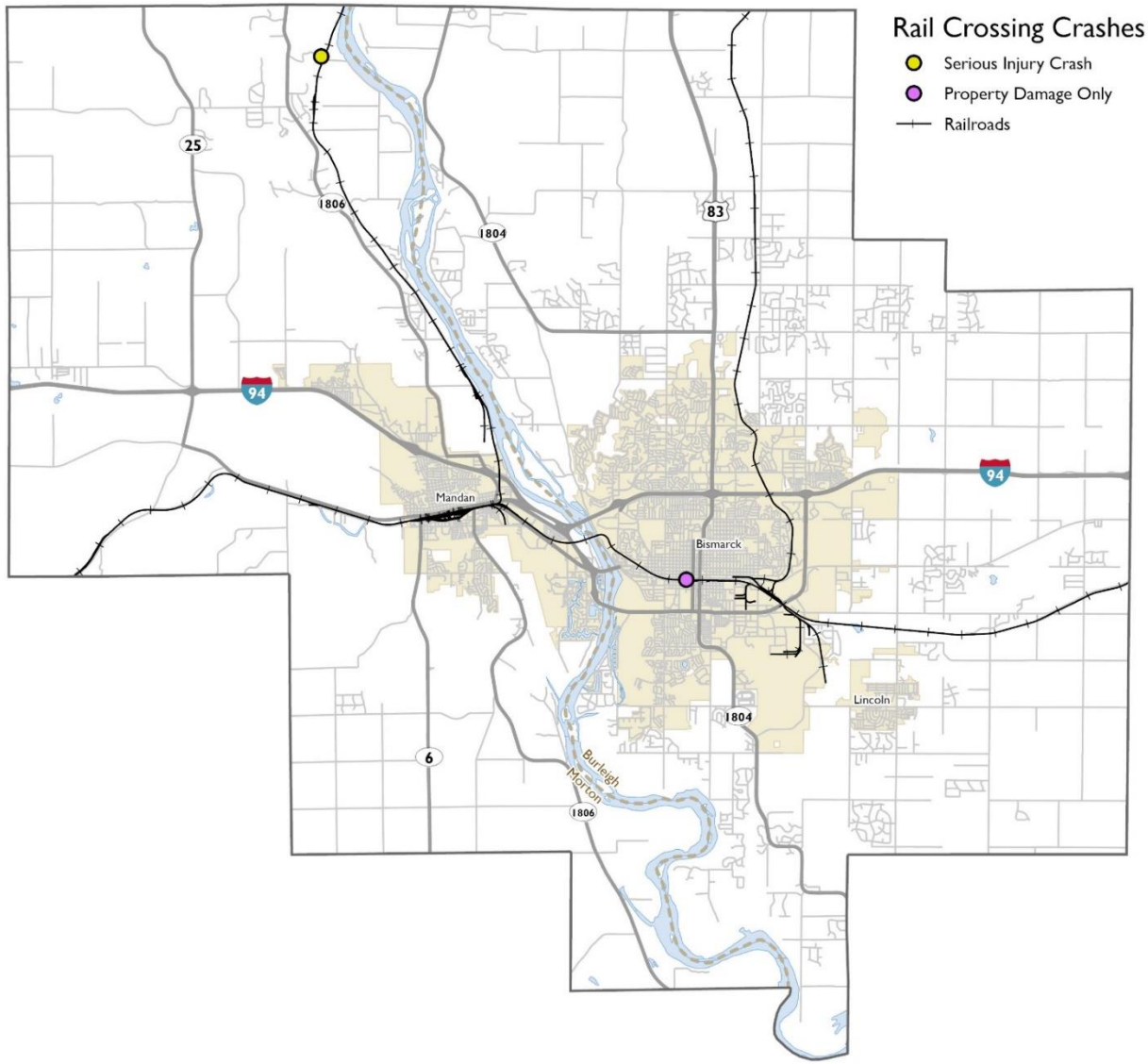
Source: North Dakota Department of Transportation Data

Figure 21: Bicycle- and Pedestrian-Involved Fatal and Serious Injury Crashes, 2018 – 2022



Source: North Dakota Department of Transportation Data

Figure 22: Rail Crossing Crashes



Source: North Dakota Department of Transportation Data

Traffic Operations

Baseline traffic operations for roadways within the MPO area were analyzed to identify the corridors experiencing operational issues. Traffic operations were reviewed from three perspectives:

- Peak Hour Speed Reduction
- Planning Level-of-Service
- Passenger travel reliability

Peak Hour Speed Reduction

Existing peak hour travel conditions were analyzed using travel speed data obtained from the National Performance Research Dataset (NPMRDS) for the year 2022. This data was collected in 15-minute intervals and was used to identify the largest reductions in travel speeds on the NHS. Based on the NPRMDS data, the peak hours within the MPO Area were determined to be:

- **AM Peak Hour**
- **PM Peak Hour**

After defining the peak hour periods, the travel delays were calculated by segment through comparing the average observed travel speed during peak conditions to a typical off-peak travel speed. The resulting speed reduction coefficient between average observed travel speeds during the peak hour and typical off-peak travel speeds then served as the delay measure for peak hour speed reductions.

Figure 23 and **Figure 24** show the AM and PM peak hour speed reduction coefficients for the MPO Area. During the AM peak hour, the main corridors experiencing substantial delay, considered as peak speeds at 40 percent or below typical off-peak free flow speeds are:

- **43rd Avenue NE**, from US 83 to Centennial Road
- **ND 1804**, from E Divide Avenue to I-94
- **E Main Avenue**, from N Washington Street to N 9th Street
- **E Bismarck Expressway**, from University Drive to S 7th Street

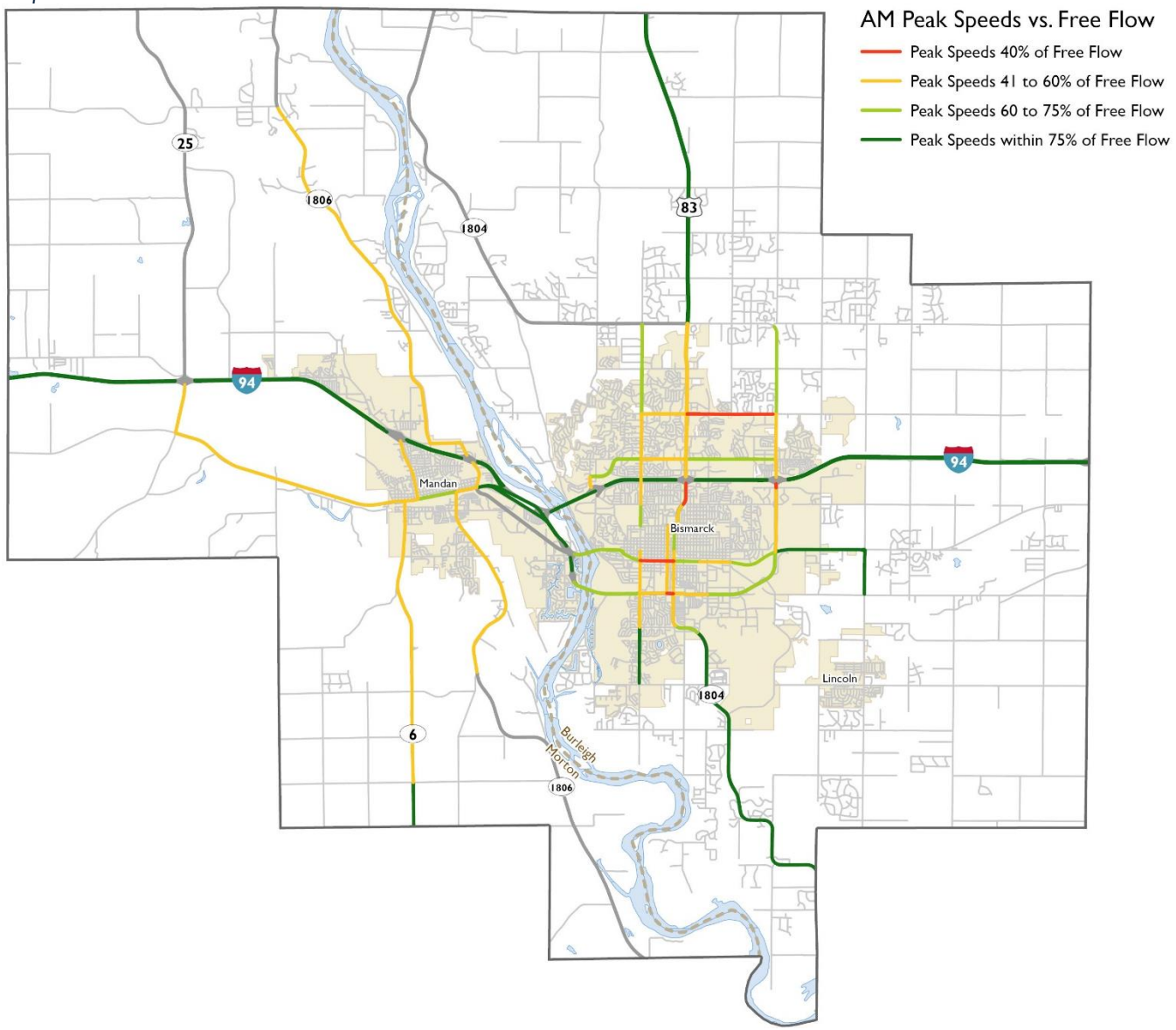
It is noted that events such as road construction, winter weather, and recurring traffic crashes can influence travel times. Understanding this, the speed reduction coefficients illustrate travel conditions at a certain point in time and consideration of these events should be made when using this data to inform planning decisions. For instance, there was long-term road construction on 43rd Avenue NE during 2022 which likely influenced the resulting speed coefficient for this segment.

During the PM peak hour, the main corridors experiencing substantial delay include:

- **E Main Avenue**, from N Washington Street to S 9th Street
- **E Bismarck Expressway**, from S Washington Street to University Drive
- **Tyler Parkway**, from W Century Avenue to I-94

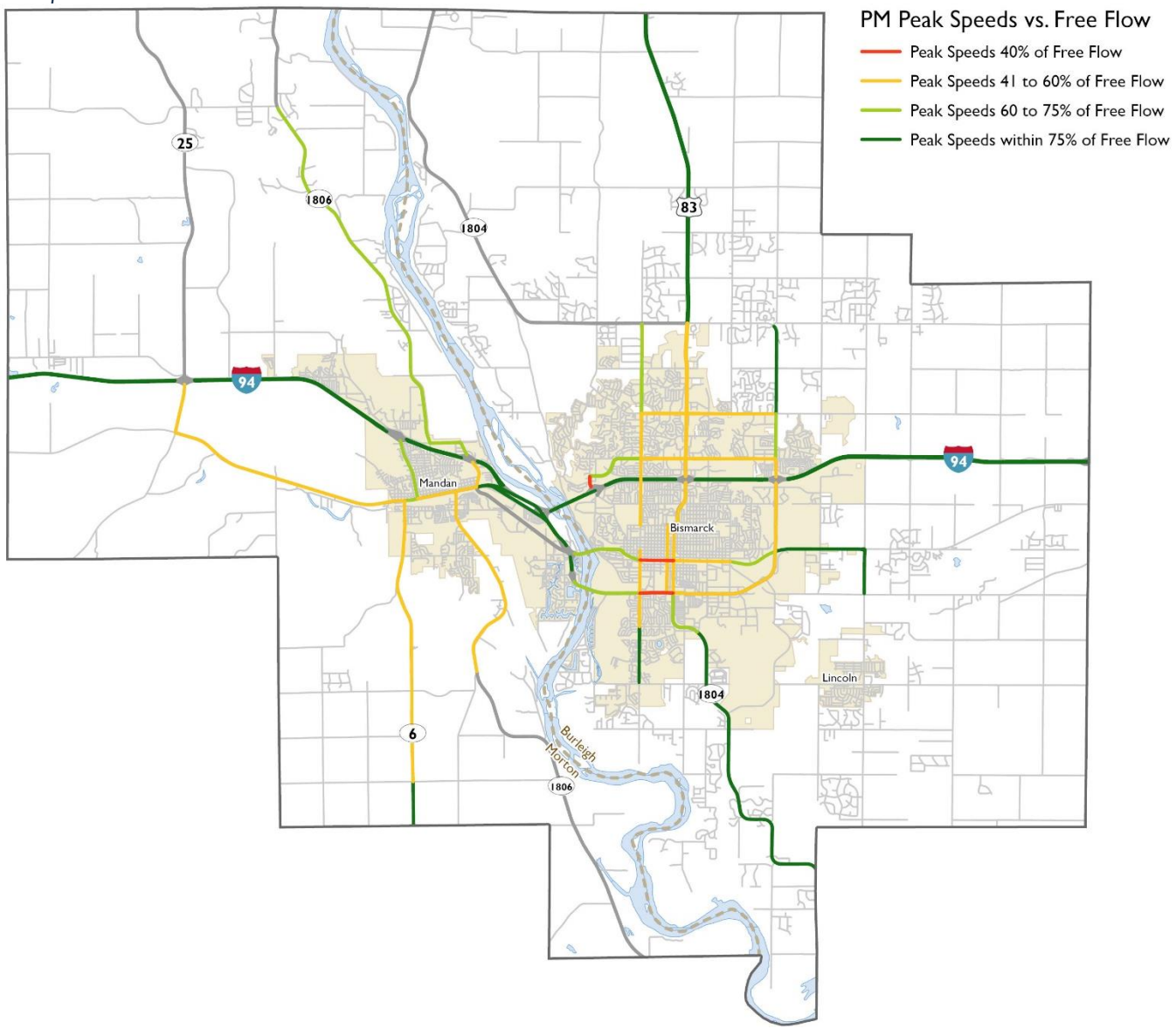
As **Figure 24** indicates, less delay was observed in the PM peak hour when compared to the AM peak hour. One possible factor influencing this could be due to a wider dispersion of commute trips home from work in the afternoon/evening during the PM peak hour as travelers leave work at varying hours whereas commute trips made to work during the AM peak hour are likely more concentrated, with more individuals beginning their commute trips at approximately the same time in the morning.

Figure 23: AM Peak Hour Speed Reductions



Source: National Performance Research Dataset, 2022

Figure 24: PM Peak Hour Speed Reductions



Source: National Performance Research Dataset, 2022

Planning Level-of-Service

Planning level-of-service (LOS) is a high-level approach to estimating peak hour traffic operations that compares the annual average daily traffic volumes (AADTs) of a roadway to its design capacity. Central to this comparison is the calculation of a volume-to-capacity (V/C) ratio that estimates the efficiency of traffic operations for that roadway segment. The resulting segment V/C ratio, which is the metric used to describe the roadway's LOS, are associated with letter grades that reflect the estimated peak hour traffic operations, with a grade of "A" indicating free flow conditions and a grade of "F" indicating complete gridlock. **Figure 25** details each LOS grade. This approach to analyzing traffic operations goes beyond the peak 15-minute delay analysis described in the preceding section and offers a more complete view of traffic operations during a full peak hour rather than the worst 15 minutes of the day.

The resulting LOS for the MPO Area is shown in **Figure 26**. As **Figure 26** shows, the majority of roadways within the region are operating at LOS B or better and do not exhibit congestion issues during peak travel hours. The corridors that do exhibit congestion issues are estimated to operate at LOS C and D; these corridors will be considered as candidates for potential improvements such as widenings, turn lanes, access management, and other enhancements to improve peak hour traffic operations.

Figure 25: Level of Service Definitions

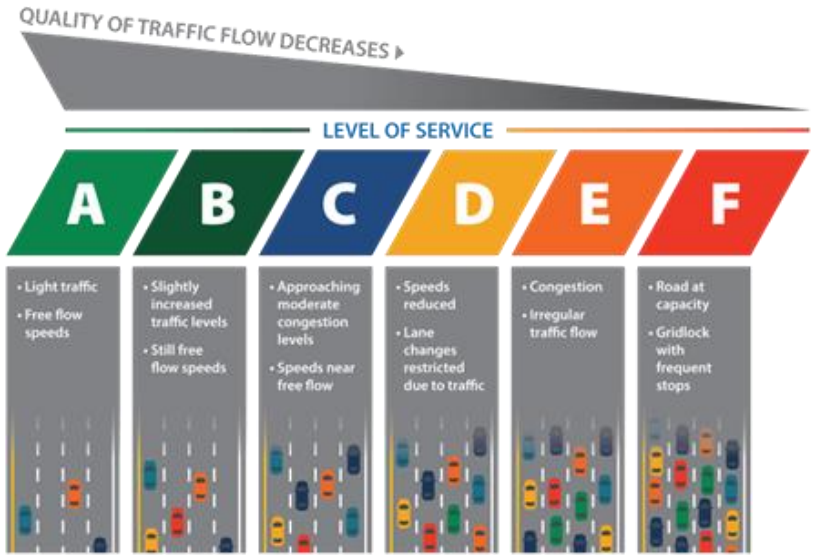
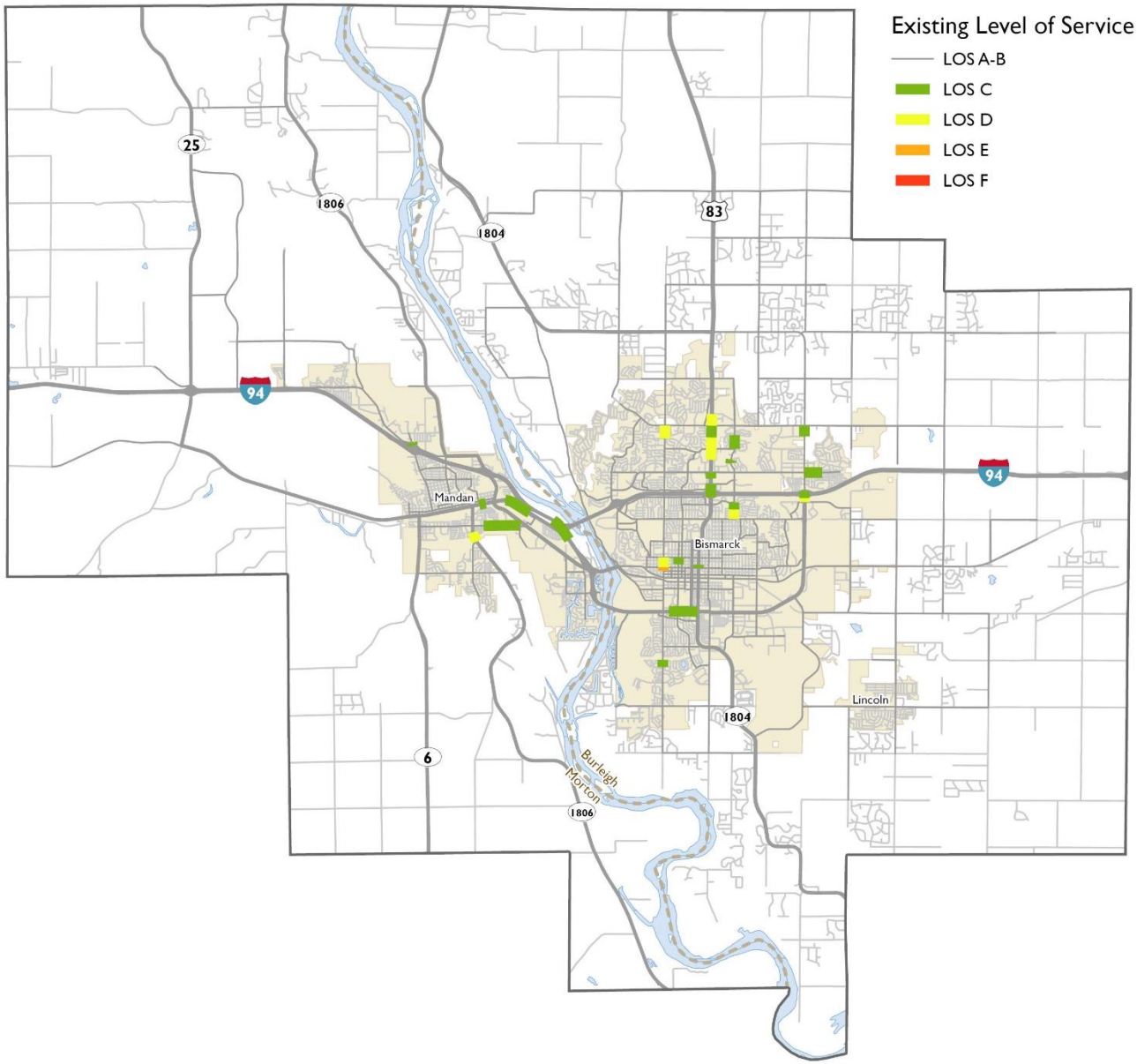


Figure 26: Existing Planning Level of Service for the Bismarck-Mandan MPO Area



Travel Reliability

Travel reliability measures the predictability of travel times along a corridor. This approach to analyzing traffic operations differs from the planning LOS approach due to the focus on understanding how travel times for a given corridor differ; a corridor identified as being congested during peak hour travel times can still be deemed reliable if that congestion is easily predicated by travelers who can then anticipate this congestion and plan their travel around it.

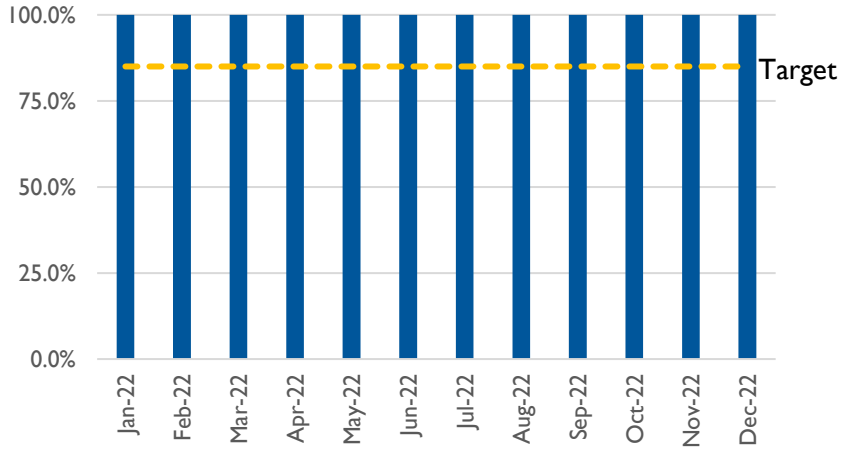
The metric used to describe travel reliability conditions for passenger vehicles is referred to as Level of Travel Time Reliability (LOTTR) while travel reliability conditions for freight traffic is quantified using a metric referred to as Truck Travel Time Reliability Index (TTTR).

Reliability data analyzed for the MPO's current travel reliability conditions was sourced from NPMRD for the year 2022. Travel reliability conditions for passenger vehicles are discussed here while travel reliability conditions for freight vehicles are discussed in the **Freight System** section of this report.

A series of Federal performance measures are concerned with travel reliability for state DOTs and MPOs. As such, the Bismarck-Mandan MPO has adopted performance targets for the region's transportation system which include system reliability targets; the MPO has elected to adopt the same reliability targets used by NDDOT. For the Intestate system within the MPO Area, the current reliability target is 85 percent of person-miles traveled are reliable. The same target of 85 percent of person-miles traveled was adopted for the non-Interstate NHS System.

Figure 27 and **Figure 28** summarize progress made towards these targets based on NPMRDS data for the year 2022. **Figure 27** summarizes the percentage of person-miles traveled on the Interstate, by month, that were considered reliable for the year 2022. As the figure shows, the percentage of person-miles traveled on the Interstate system within the MPO Area was 100 percent reliable in 2022, while the performance target was 85 percent. The main takeaway is that users of I-94 were able to anticipate any sort of delay along the Intestate and adjust their travel plans accordingly.

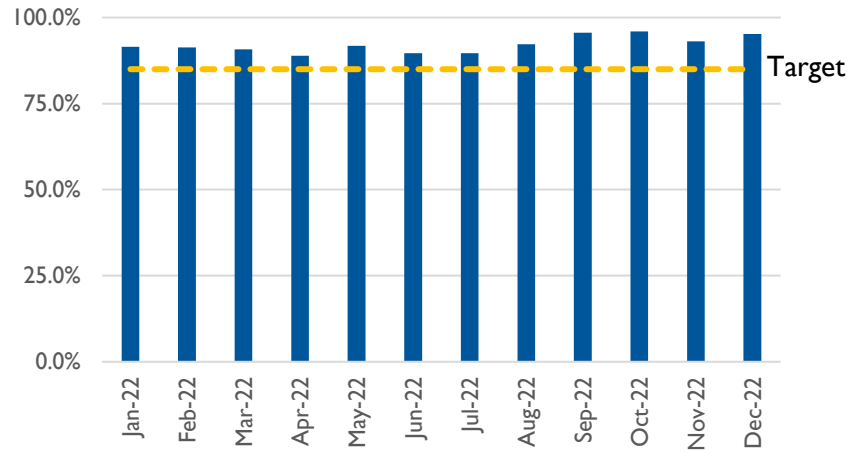
Figure 27: Percent of Person-Miles Traveled that Were Reliable by Month for the Interstate System, 2022



Source: National Performance Management Research Dataset, 2022

Figure 28 summarizes the percentage of person-miles traveled on the non-Interstate NHS, by month, that were considered reliable for the year 2022. Monthly travel reliability conditions for the non-Interstate NHS were more variable when compared to the Interstate system but each the percentage of person-miles traveled that were reliable exceeded the MPO's target of 85 percent each month. The months demonstrating the highest percentage of reliable person-miles traveled included September, October, and December while April, June, and July recorded the lowest percentages of reliable person-miles traveled.

Figure 28: Percent of Person-Miles Traveled that Were Reliable by Month for the Non-Interstate NHS, 2022



Source: National Performance Management Research Dataset, 2022

Figure 29 shows LOTTR results for the MPO Area's Interstate and non-Interstate NHS based on NPMRDS data for the year 2022. This data represents the annual measure of LOTTR for both systems, in which a LOTTR at or below 1.5 is considered reliable while anything over 1.5 is considered unreliable.

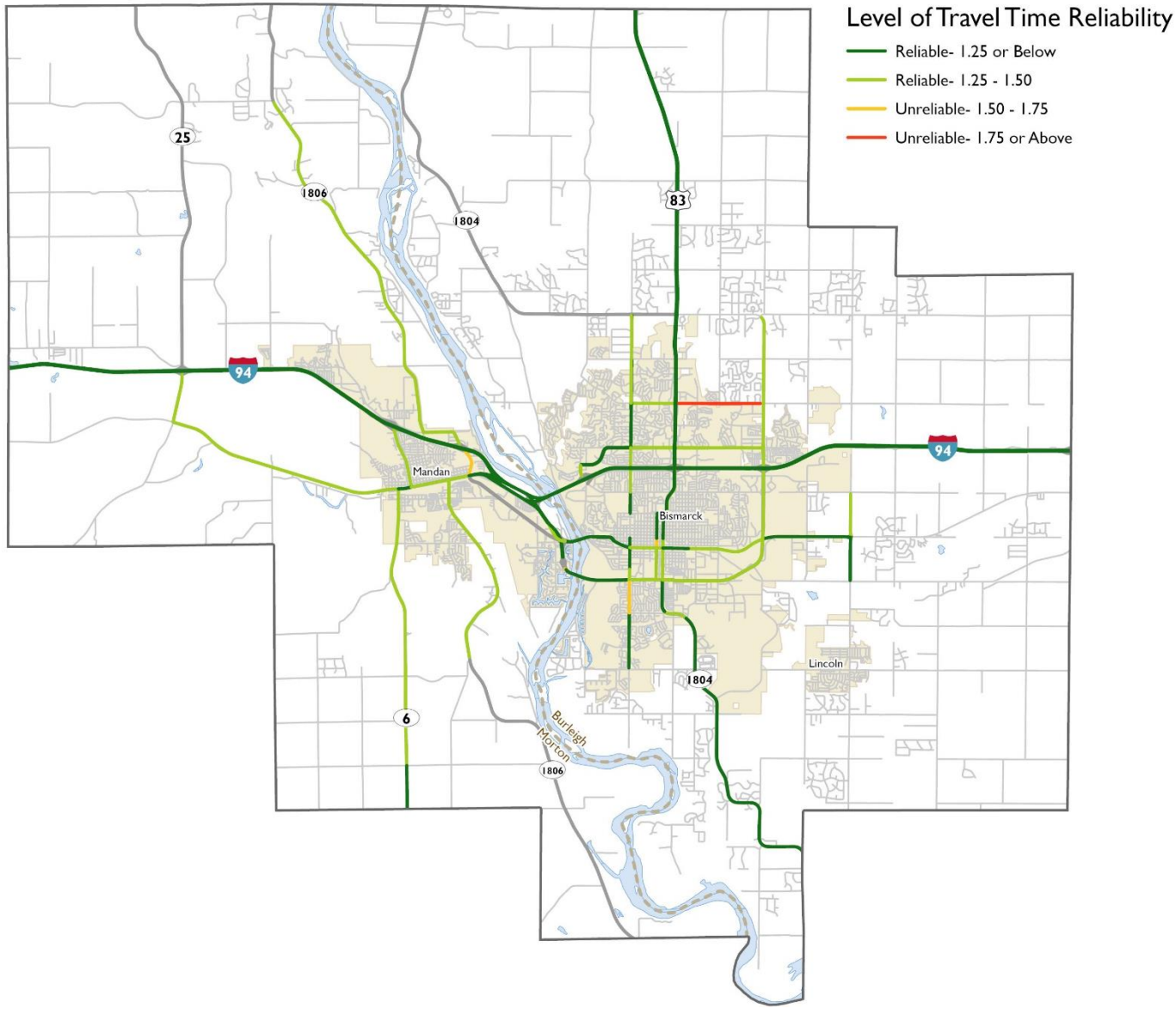
I-94 segments within the MPO Area were shown to have LOTTRs below 1.25 which supports the findings of **Figure 27** in that I-94 was reliable each month in 2022.

As detailed in the preceding section, LOTTR for the NHS displayed much more variation across the system than was recorded for the Interstate System. While most segments of the NHS recorded and LOTTR between 1.25 and 1.50 and were considered reliable, several segments exhibited LOTTRs above 1.50. These corridors include:

- **43rd Avenue NE**, from US 83 to Centennial Road
- **N 7th Street**, from E Main Avenue to E Rosser Avenue
- **S Washington Street**, from E Wachter Avenue to W Bismarck Expressway
- **Mandan Avenue NE**, from I-94 to Main Street E

It was noted that during the reliability analysis year of 2022, 43rd Ave North was under construction likely leading to the elevated levels of unreliable travel.

Figure 29: Passenger Level of Travel Time Reliability for the Bismarck-Mandan MPO Area



Source: National Performance Management Research Dataset, 2022

Multi-Modal Conditions

Existing multi-modal conditions for the MPO's transportation were also reviewed, with a focus on the existing freight, bicycle and pedestrian, transit systems, as well as regional connections including intercity bus service, passenger rail, aviation, waterways, pipelines, and alternate mobility providers.

Freight System

Freight plays a key role in the Bismarck-Mandan region's economy by facilitating the movement of goods through the area. The main freight assets found within the MPO region are the network of Federal, state, and local truck routes that provide mobility and accessibility for highway freight movements, and rail lines that support rail freight movements.

The importance of the freight system to the MPO region was highlighted in the Regional Freight Study completed in 2018. This study sought to identify critical freight routes, typical freight movements, and investment needs for freight-supportive infrastructure. Key findings of the study are included in this section of the Baseline System Conditions report.

An additional planning effort related to Bismarck-Mandan's multi-modal freight system is NDDOT's State Freight and Rail Plan published in 2023; this plan assessed all freight modes to identify current needs and issues facing the state's multi-modal freight system and provided policy, program, and process recommendations while identifying potential projects to support the state's freight system in terms of efficiency, reliability, and safety.

Freight Highway Assets

The MPO's assets that support freight highway movements include Federally, state, and locally designated truck routes. This section of the report summarizes these routes and summarizes the operational characteristics of the freight highway system, including truck generators, daily truck trips, and annual tonnage moved on freight routes. Also included is a discussion of the MPO's Truck Travel Time Reliability Index performance.

Federally Designated Routes

The adoption of the Fixing America's Surface Transportation (FAST) Act in 2015 established the National Highway Freight Network (NHFN). The NHFN is a series of subsystems that provide the strategic direction of Federal resources and policies to improve the performance of the nation's freight highway system. The subsystems comprising the NHFN include:[2]

- **Primary Highway Freight System (PHFS)**: Highways identified as the most critical highway portions of the nation's freight transportation system.
- **Other Interstate portions not on the PHFS**: Remaining Interstate highways that are not included in the PHFS and provide important continuity and access to freight transportation facilities.
- **Critical Rural Freight Corridors (CRFCs)**: Public roads outside of urbanized areas that provide access and connectivity to the PHFS and Interstate with critical freight facilities.
- **Critical Urban Freight Corridors (CUFCs)**: Public roads within urbanized areas that provide access and connectivity to the PHFS and Interstate with critical freight facilities.

[2] USDOT, *National Highway Freight Network*

Currently, there are no PHFS corridors within the Bismarck-Mandan MPO region. I-94 is designated as part of the Other Interstate portions not on the PHFS.

Several CUFCs are found in the MPO region, as shown in **Figure 32.** There are no routes designated as CRFCs in the MPO region at this time.

State Designated Routes

NDDOT has developed a Strategic Freight System Index to classify key freight-related infrastructure for roadways, rail, air, and pipeline modes. The tiered index classifies infrastructure based on the relationship to Federal, state/regional, and local freight networks:[3]

- **Level One**: Infrastructure that supports international and interstate freight movements and CRFCs.
- **Level Two**: Infrastructure that supports regional and intrastate freight movements.
- **Level Three**: Infrastructure that facilitates local freight movements.

Table 10 summarizes the freight highway components of the Strategic Freight System Index while **Figure 30** presents the state's strategic freight routes. **Figure 31** shows the existing state strategic freight routes within the MPO Area as published in the previous State Freight Plan in 2015.

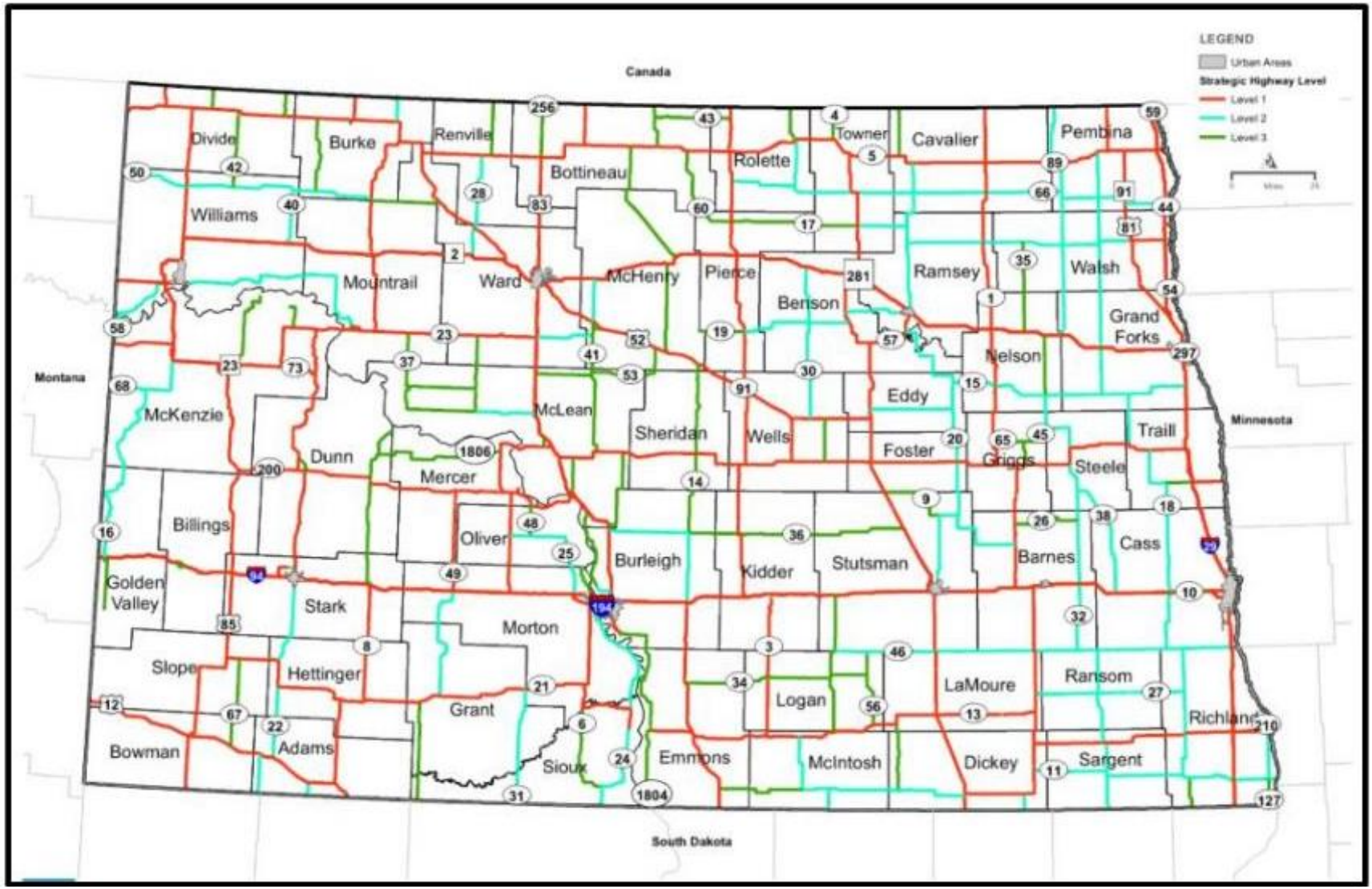
Table 11: NDDOT Strategic Freight System Index- Freight Highway Components

Level One	Level Two	Level Three
• Interstate and Interregional Highways • Congressional Designated High Priority Corridors • STRAHNET • National Truck Network • Energy/Agricultural Access Corridors • High Truck Volume Principal Arterials • 24-hour Border Crossings and Commercial Facilities Processing More than 40,000 Trucks per Year	• State Corridors • District Corridors • Limited County Major Collectors • City Principal Arterials • Border Crossings Processing Between 5,000 and 39,999 Trucks per Year and With Opening Hours of at Least 12 Hours	• District Collectors • Some County, City, Township and Tribal Roads • Border Crossings Processing Fewer than 5,000 Truck Crossings per Year

Source: North Dakota Department of Transportation, *State Freight and Rail Plan*

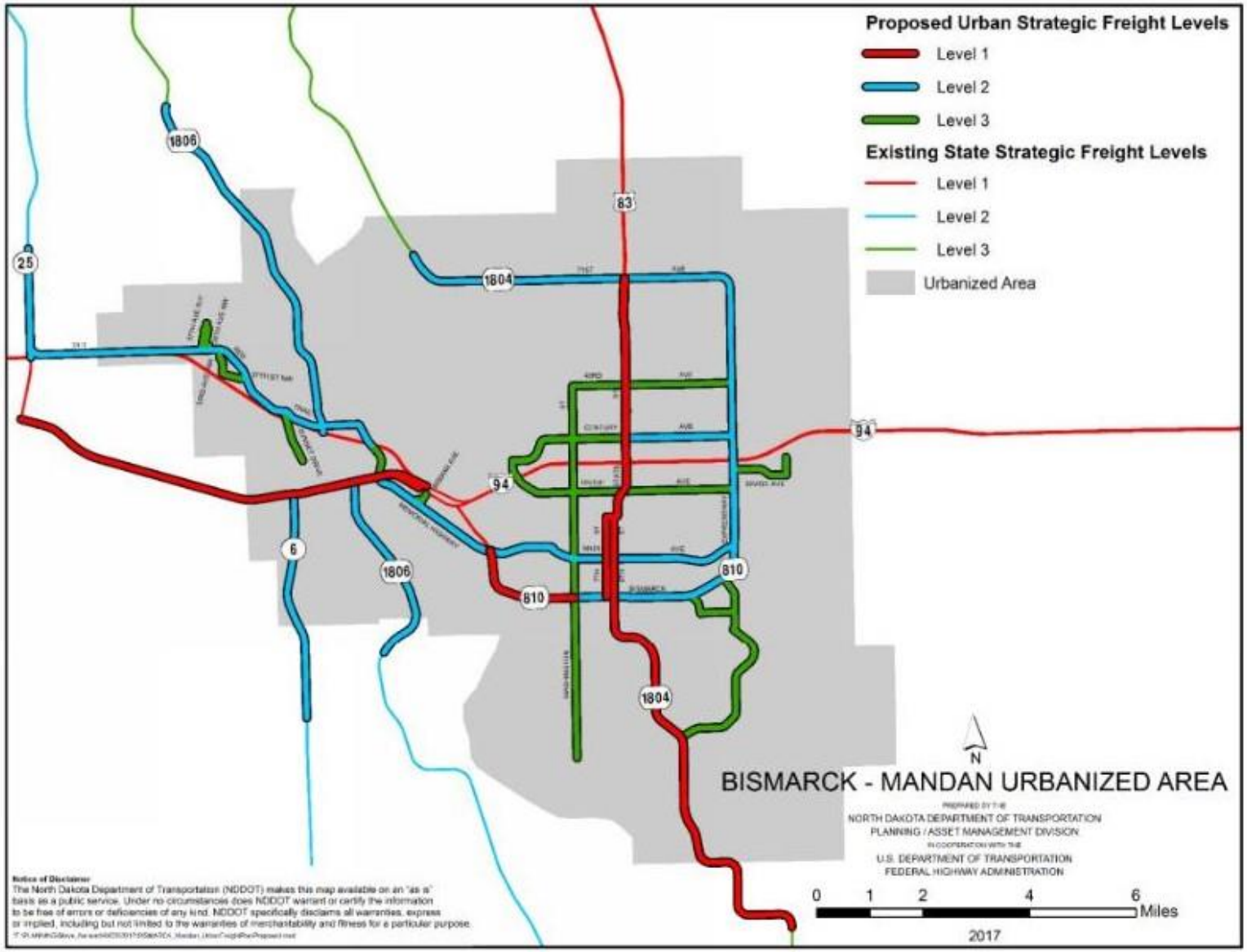
[3] North Dakota Department of Transportation, *State Freight and Rail Plan*

Figure 30: North Dakota Strategic Freight System Highway Classifications



Source: North Dakota Department of Transportation

Figure 31: NDDOT Strategic Freight Index System for the Bismarck-Mandan MPO Area



Source: North Dakota Department Transportation

Local Routes

City of Bismarck

The City of Bismarck has designated local truck routes, and these routes are required for use by any vehicle with an actual or registered gross vehicle weight at or exceeding 10,000 pounds.[4] These vehicles may leave the designated routes to access a destination via the shortest path possible via non-truck route streets. Trucks making local deliveries and pickups are also required to use the designated routes except for when making the delivery or pickup, in which case they are required to use the shortest distance route possible between the delivery or pickup destination and the designated truck route.

In addition to the designated truck routes, several streets within the City of Bismarck are posted as year-round 6-Ton Load Restrictions. No vehicle with a divisible load exceeding the 6-ton limit may use these routes at any time. The 6-Ton Load Restriction routes include:

- **Country West Road**, from Clydesdale Drive to Century Avenue;
- **Century Avenue**, from Centennial Avenue east to the end of the pavement;
- **Burnt Boat Road**, from Clairmont Road to North Grandview Lane;
- **Ash Coulee Drive**, from Water Tower to Tyler Parkway/15th Street;
- **Airway Avenue**, from Airport Road to Northern Plains Drive.

The local truck routes also include roadways in which fringe agreements have been entered into with Burleigh County for the purposes of delineating operations and maintenance responsibilities.

City of Mandan

The City of Mandan's locally designated truck routes are allowed for use under NDDOT's permitting procedures and allow freight operators holding the required permits to transport freight through the city.[5]

There is not a seasonal load restriction in the City of Mandan as the City does not have a truck regulatory department at this time.

Freight Generation

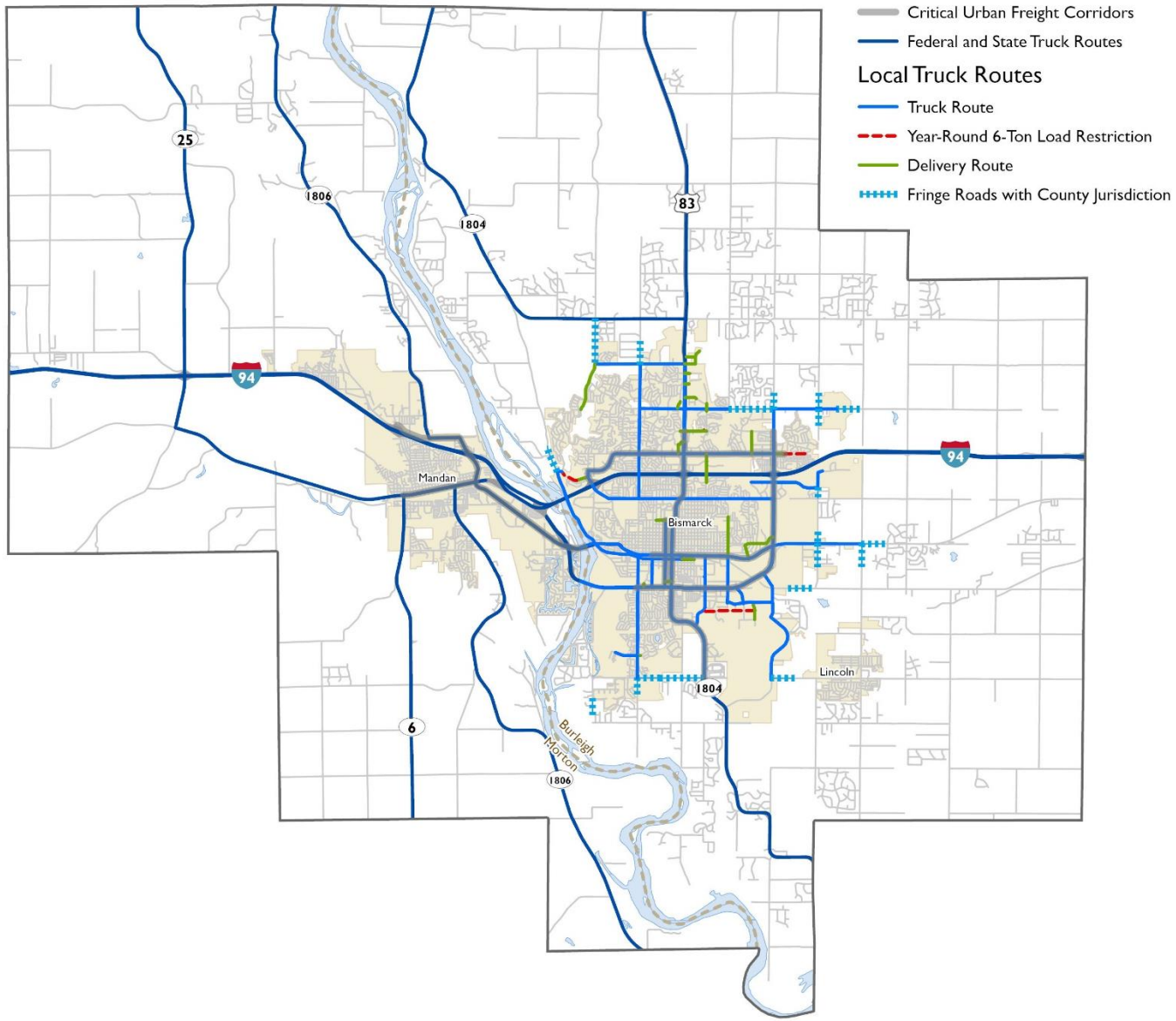
Freight generation provides insight into the relationship between existing land uses and freight activity. An analysis of the current freight generators within the Bismarck-Mandan MPO Area was conducted to identify the top locations that generate truck movements today. The analysis was based on trip generation rates sourced from FHWA's Quick Response Freight Methods, which were applied to 2019 employment by industry data sourced from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) dataset. The data was then aggregated to the 2020 census block group level and represents the number of trucks generated in each block group daily.

The results of the freight generation analysis are shown in **Figure 33**. The block groups estimated to generate the highest number of trucks daily are found east and north of the City of Bismarck. Other areas of high daily truck generation are found in the eastern portion of the City of Mandan. The general trend observed from the daily truck generation analysis is the presence of high truck generation block groups that are in close proximity to state highways and Interstate 94 (I-94). This observation would indicate the importance of access to the region's highway system for freight trucks, as well as the industrial land uses that rely on freight trucks for their operations.

[4] City of Bismarck, *Load Permits, Restrictions & Truck Routes*

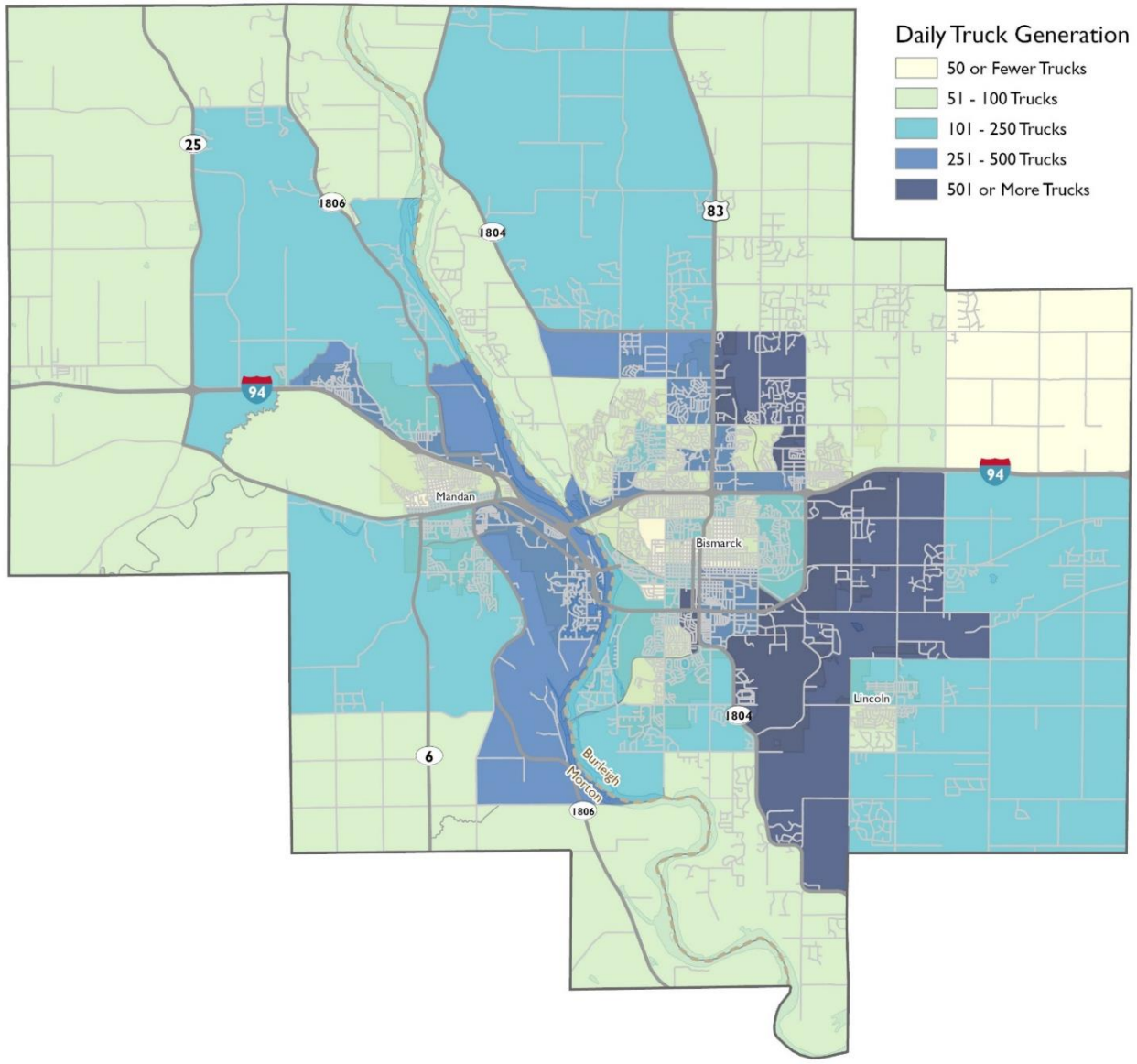
[5] City of Mandan, *Load Restrictions*

Figure 32: Federal, State, and Local Truck Routes



Source: City of Bismarck, February 2024

Figure 33: Daily Truck Generation Estimates for the Bismarck-Mandan MPO Area



Source: United States Census Bureau Longitudinal Employer-Household Dynamics, United States Department of Transportation Quick Response Freight Manual

Daily Truck Trips

Additional data related to freight that was reviewed as part of the Baseline System Performance analysis were daily truck trips and annual tonnage moved by freight trucks on MPO roadways. The data reviewed for these topics was sourced from FHWA's Freight Analysis Framework 5 (FAF 5), which models national freight movements for all modes using the base year of 2017.

Estimates of daily truck trips for routes within the MPO Area are shown in **Figure 35**. The routes estimated to support the highest numbers of daily trips include I-94, which is estimated to facilitate over 500 truck trips per day, and U.S. 6 and U.S. 83, which are both estimated to facilitate over 251 daily truck trips.

Annual Tonnage

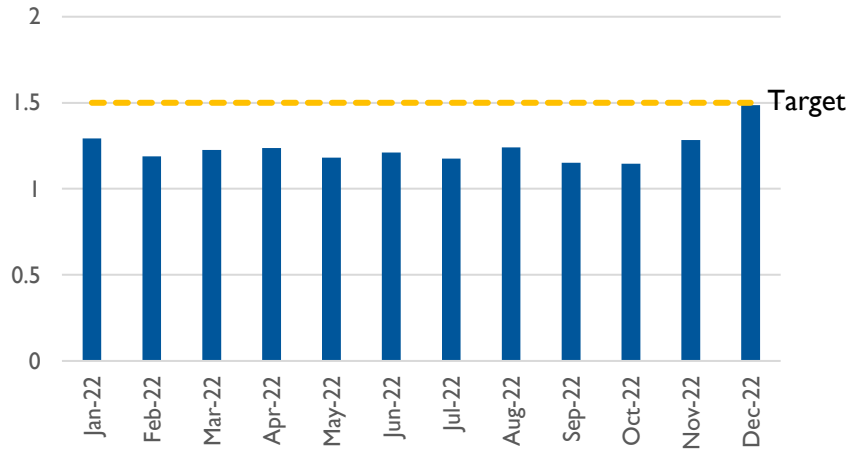
Estimates for the annual tonnage, in terms of kilotons, moved on roadways within the MPO Area are also provided by FAF 5, and are shown in **Figure 36**. The routes estimated to carry the highest levels of annual tonnage reflect those that are estimated to facilitate the highest levels of daily trips, with I-94 estimated to carry over 5,000 kilotons annually. U.S. 6 and U.S. 83 are estimated to carry over 2,501 kilotons per year.

Truck Travel Time Reliability Index

Truck Travel Time Reliability Index (TTTR), as stated in the **Traffic Operations** section of this report, indicates the reliability of travel for freight trucks along the Interstate system. TTTR data sourced from the NPMRDS for the year 2022 was used to calculate the TTTR index for I-94 within the MPO Area.

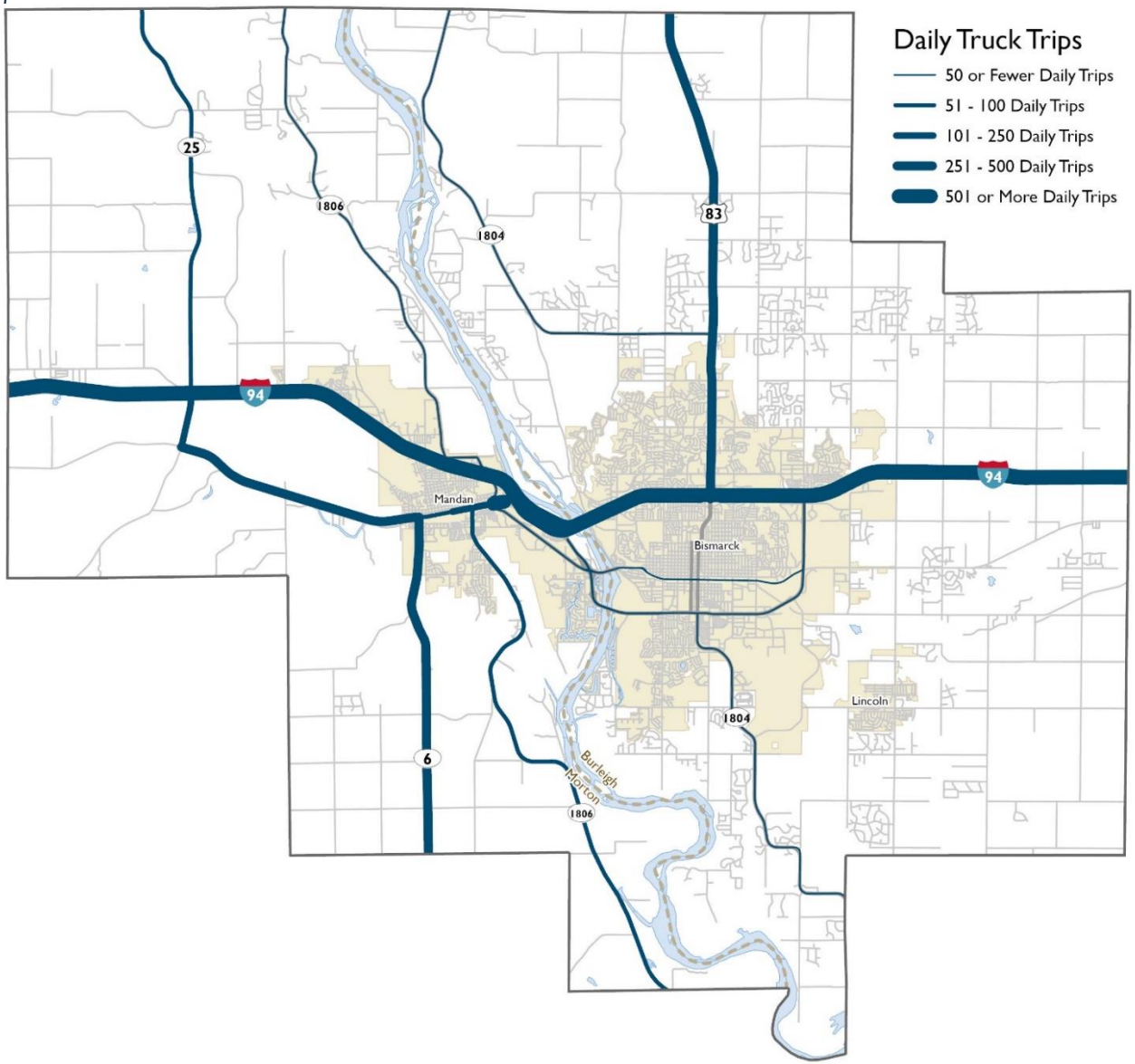
Figure 34 shows the resulting Interstate TTTR index for the Interstate within the MPO Area. Using a TTTR of 1.5 as the threshold for determining reliable and unreliable Interstate segments, the TTTR index calculated for I-94 found that the majority of the MPO's Interstate system was reliable in 2022. The only I-94 segments that demonstrated an unreliable TTTR index were the ramp terminals at 46th Avenue SE in the City of Mandan; the narrow design and lower speeds of these ramp terminals are likely factors influencing the unreliability of these segments for freight trucks. **Figure 37** presents the annual TTTR performance for the MPO's Interstate System based on 2022 NPMRDS data.

Figure 34: Monthly TTTR for the Interstate System, 2022



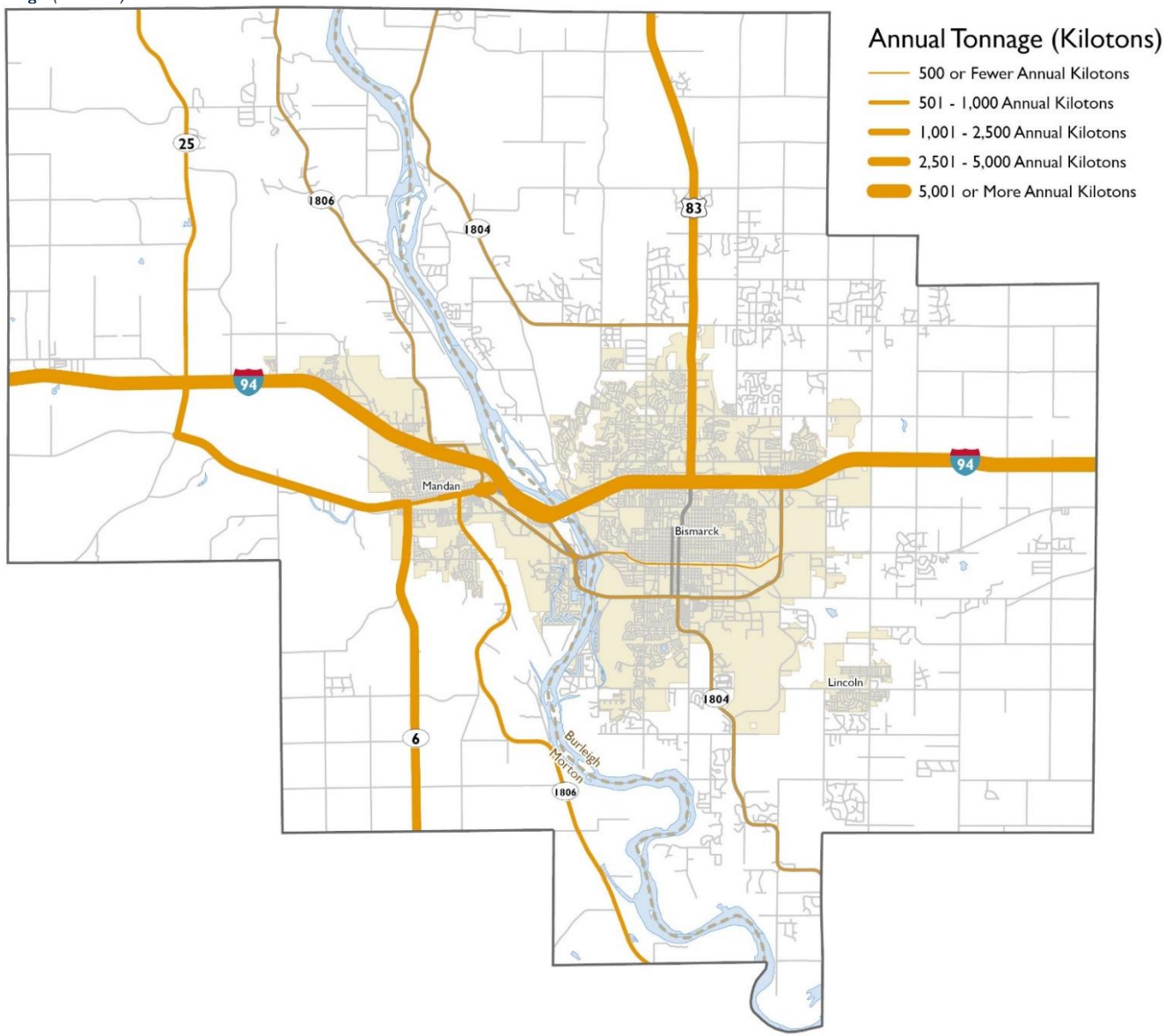
Source: National Performance Management Research Dataset, 2022

Figure : Daily Truck Trips



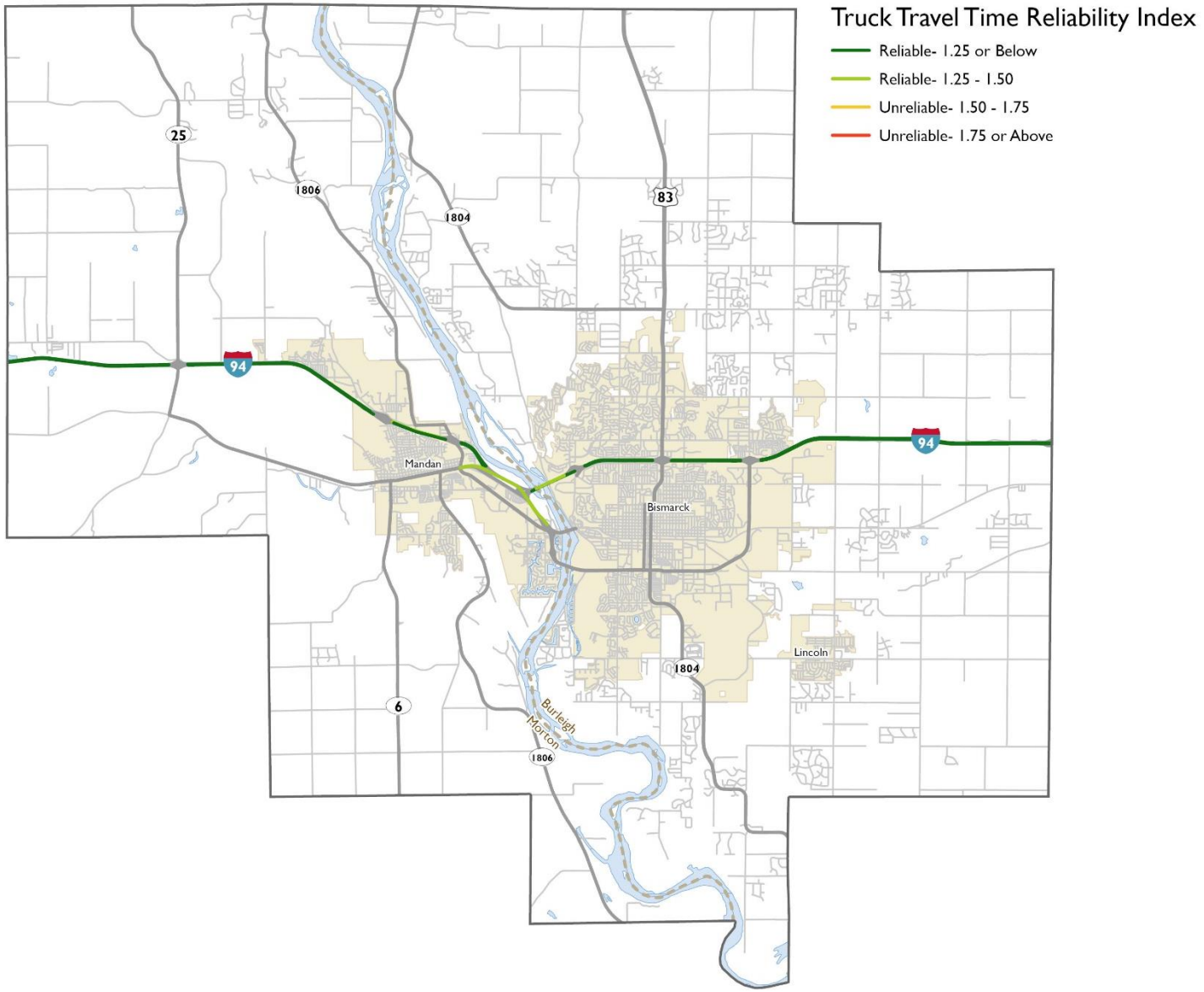
Source: Federal Highway Administration, Freight Analysis Framework 5

Figure 35: Annual Tonnage (Kilotons)



Source: Federal Highway Administration, Freight Analysis Framework 5

Figure 36: Truck Travel Reliability Index for the MPO Area, 2022



Source: National Performance Management Research Dataset, 2022

Freight Rail Assets

Rail operations are a vital component of the freight system as well as the overall multi-modal transportation network. The intersection of rail lines with roadways presents safety and mobility concerns when these crossings are at-grade owing to potential collisions and vehicle delays during train crossing events.

Freight railroads within North Dakota facilitate the movement of large quantities of commodities across the state. The State Freight and Rail Plan acknowledges the importance of freight rail operations and includes this mode in the Strategic Freight System Index as shown in **Table 11** while the locations of the MPO's freight rail assets are shown in **Figure 38**.

Table 12: NDDOT Strategic Freight System Index- Freight Rail Components

Level One	Level Two	Level Three
• Class I Mainlines • Strategic Rail Corridor Network	• Branch lines capable of carrying 286,000-pound rail cars	• Branch lines capable of carrying 268,000-pound rail cars

Source: North Dakota Department of Transportation, *State Freight and Rail Plan*

Rail Lines

Rail operations serving the Bismarck-Mandan MPO Area are operated by Burlington Northern Santa Fe (BNSF) and Dakota, Missouri Valley, and Western Railroad (DMVW).

BNSF is a Class I railroad that provides freight rail service in the MPO Area. The BNSF line in the MPO Area is part of the designated BNSF coal network and transload network and provides a critical connection to the coal mines and coal fired power plants north of the City of Mandan.[6] The BNSF transload facility found in the MPO Area is an intermodal facility that mainly facilitates pipeline to rail transfers.

DMVM is a Class III railroad that serves the state's agriculture, energy, and biofuel industries. DMVM is a regional railroad serving North Dakota, South Dakota, and Montana and operates a fleet of 24 locomotives. Due to the majority of DMVM tracks that do not meet industry standards, there are numerous speed and weight restrictions for DMVM locomotives. The railroad interchanges traffic with BNSF within the City of Bismarck.

Rail Crossings

A total of 84 rail crossings are located within the Bismarck-Mandan MPO Area. Of the 84 crossings, 63 are at-grade while the remaining crossings are grade separated with the railroad either passing over (overpass) or under (underpass) roadways.

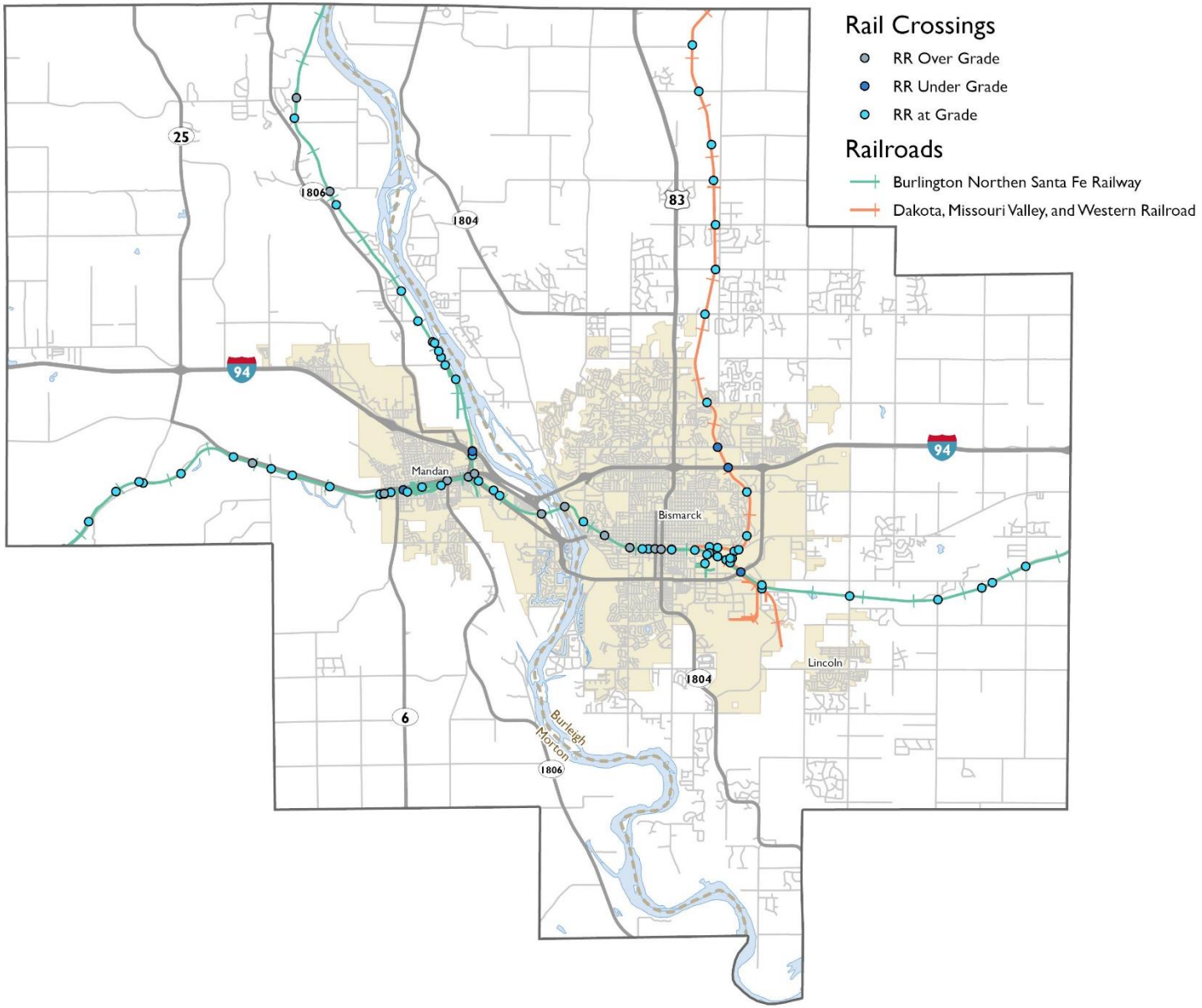
Table 12 summarizes the current rail operations in the MPO Area, including trains per day, miles of track, and rail crossings for the BNSF and DMVM railroads.

Table 13: Existing BNSF and DMVM Operations in the MPO Area

	BNSF	DMVM
Trains per Day	4-22	1
Miles of Track	57.5	17.9
At-Grade Crossings	42	21
Grade Separated Crossings	19	2

[6] Bismarck-Mandan MPO, *Bismarck-Mandan Regional Freight Study*

Figure 37: Rail Lines and Rail Crossings within the MPO Region



Pipelines

Pipelines are the number one freight mode in terms of tonnage moved to, from, and within the state of North Dakota, accounting for 53 percent of the state's total freight tonnage. These facilities are instrumental in supporting the state's energy sector as they are the most cost-effective solution to transport crude oil, natural gas, and refined products that heat our homes, fuel our vehicles, and power our businesses. NDDOT recognizes the importance of pipelines in the State's freight system and included this mode in the State's strategic freight system index as shown in **Table 13**.

Several pipelines are located within the Bismarck-Mandan MPO Area. Based on data obtained from the National Pipeline Mapping System (NPMS), these facilities carry natural gas (gas transmission) and crude oil (hazardous liquid) through the region; **Figure 40** shows pipelines located in Burleigh County while **Figure 41** shows pipeline facilities found in Morton County.

Table 14: NDDOT Strategic Freight System Index- Pipeline Components

Level One	Level Two	Level Three
• Interstate transmission pipelines	• Gathering pipelines	• Distribution pipelines

Source: North Dakota Department of Transportation, *State Freight and Rail Plan*

Air Freight

Air freight services within the Bismarck-Mandan MPO Area are facilitated through the Bismarck Municipal Airport. Bismarck Municipal Airport is designated as a Level One facility per NDDOT's Strategic Freight System Index based on the cargo movements through the airport that are carried on passenger services. **Table 14** summarizes the complete air component of the state's Strategic Freight System Index.

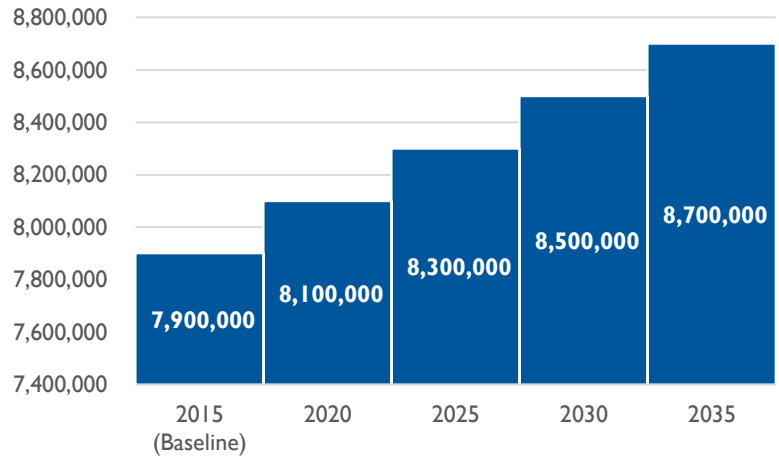
The Airport Master Plan, published in 2019, forecasts cargo operations at the Bismarck Airport through the year 2035 with 2015 serving as the baseline forecast year. These forecasts, shown in **Figure 39**, see an annual growth rate of 0.5 percent per year in cargo volumes moving through the airport. It is estimated that nearly 9 million pounds of cargo will move through the airport in 2035.

Table 15: NDDOT Strategic Freight System Index- Air Components

Level One	Level Two	Level Three
• Integrator hub airports • Airports with cargo carried on passenger services • Air Force Bases	• Integrator feeder airports	• Airports with infrequent cargo use

Source: North Dakota Department of Transportation, *State Freight and Rail Plan*

Figure 38: Forecasted Air Cargo Operations at the Bismarck Airport, 2015 – 2035



Source: City of Bismarck, *Airport Master Plan*

Figure 39: Pipelines in Burleigh County

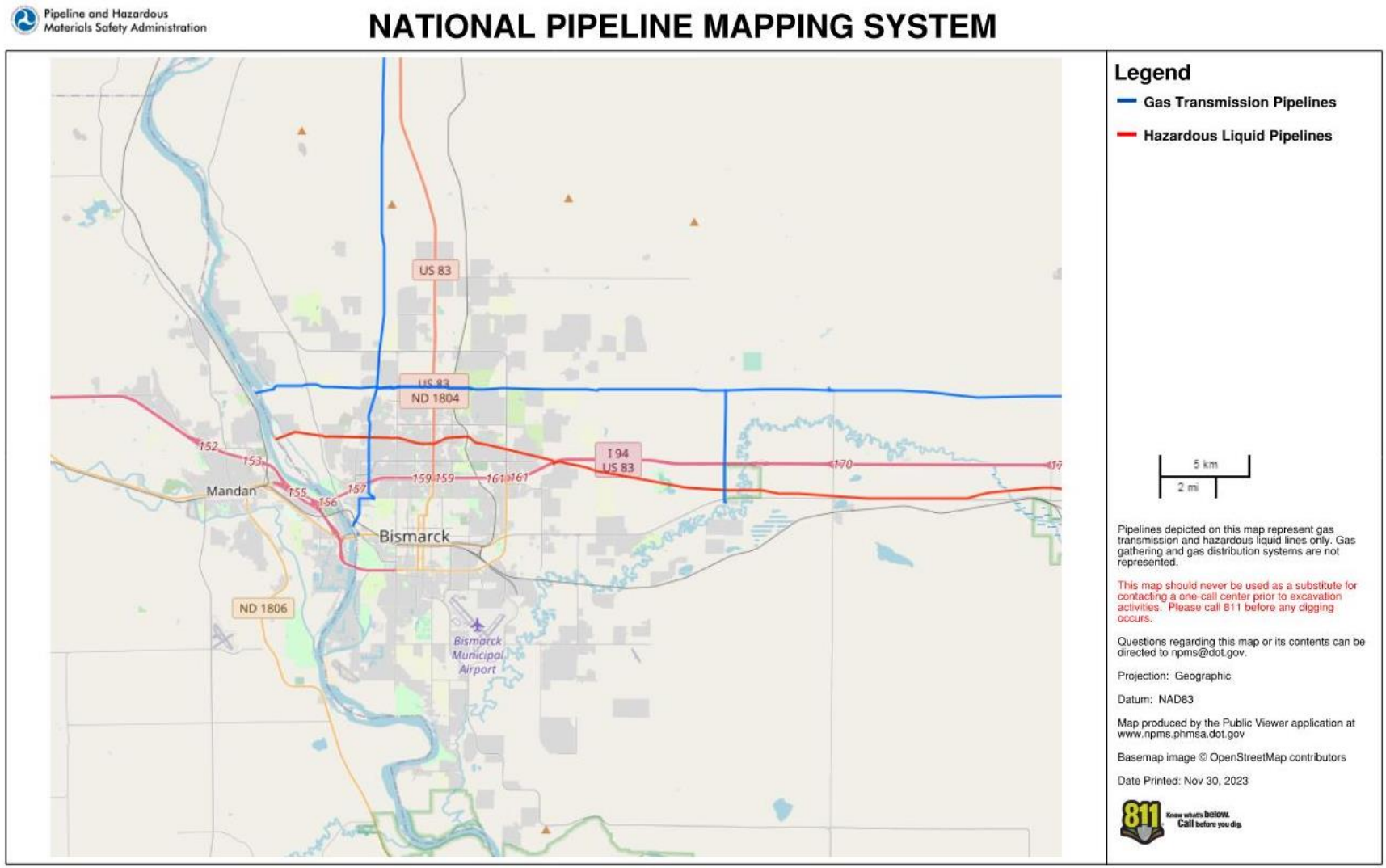
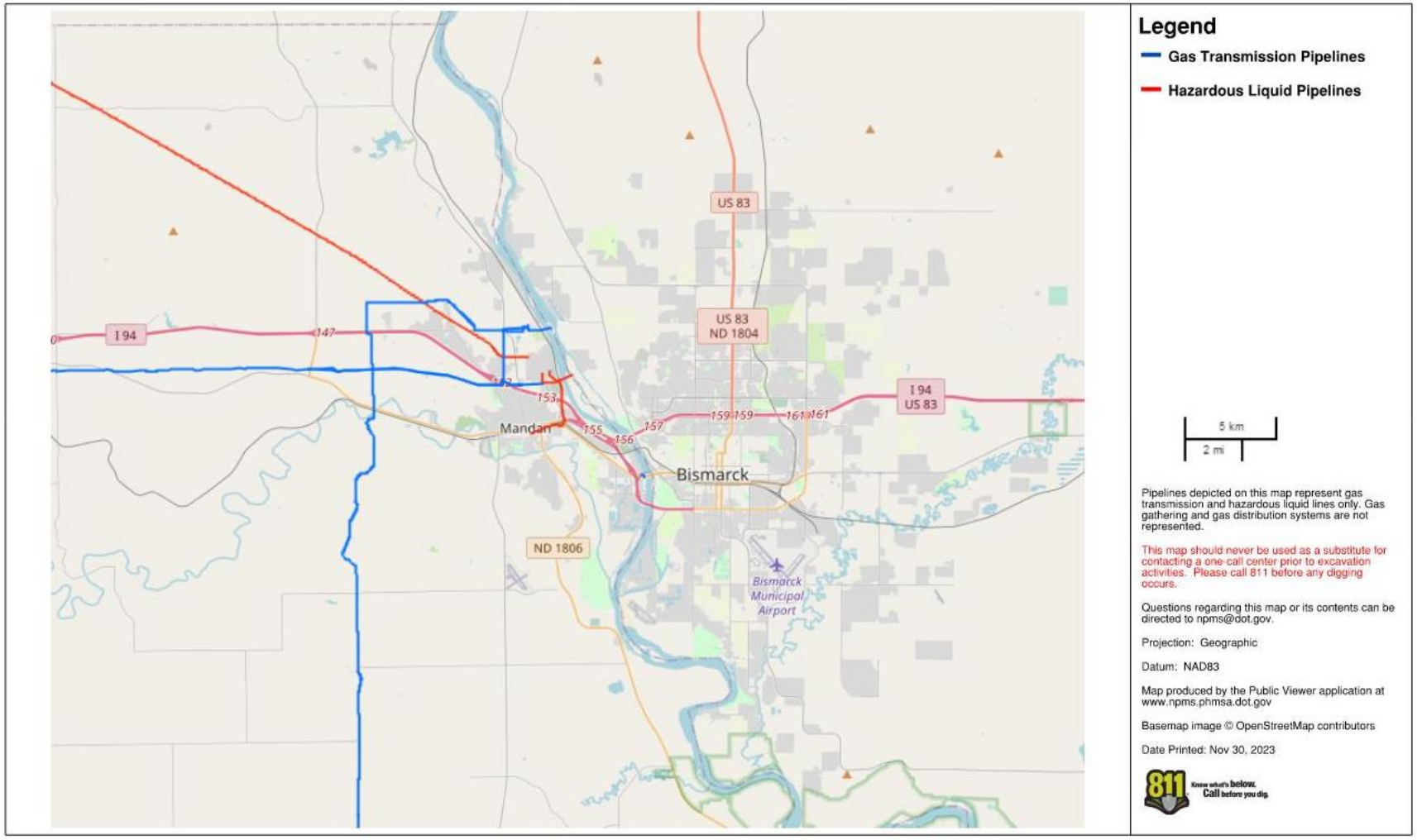


Figure 40: Pipelines in Morton County

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Bicycle and Pedestrian System

The bicycle and pedestrian system of the Bismarck-Mandan MPO Region is a valued network of off-street and on-street facilities that provide users with mobility and access to the region's recreational destinations.

To continue developing the MPO Area's bicycle and pedestrian network into a strength of the region's multi-modal transportation system, a Bicycle and Pedestrian Plan was completed in 2017. This Plan aims to grow the 5 E's—engineering, education, encouragement, enforcement, and evaluation efforts—so that bicycling and walking within the region is safe, comfortable, and reliable.

The vision-driven Plan was informed through community engagement, an existing conditions assessment, and consideration of the 5 E's to develop an implementation schedule that provides the necessary infrastructure and strategies to achieve the goals and objectives set for the bicycle and pedestrian system. The goals set forth in the Bicycle and Pedestrian Plan are summarized in **Table 15.**

Table 16: Goals of the Bismarck-Mandan Bicycle and Pedestrian Plan

Goal	Description
Network Use	Increase the number of bicycling and walking trips made by people in Bismarck and Mandan.
Connectivity	Develop a connected network of bicycling and walking throughout both communities in partnership with local, regional and state partners. Connect bicycling and walking routes to community destinations and other transportation systems, including transit.
Safety and Comfort	Build and maintain safe and comfortable bicycling and walking facilities for people of all ages and abilities. Support driving, walking, and bicycling behaviors that increase the safety of people who walk and bicycle.
Maintenance	Protect the public's investment in the bicycling and walking system over the long-term and ensure system accessibility all year round.
Planning	As new commercial and residential projects are planned, integrate bicycle and pedestrian facilities with project designs during the development review process.

Source: Bismarck-Mandan Bicycle and Pedestrian Plan

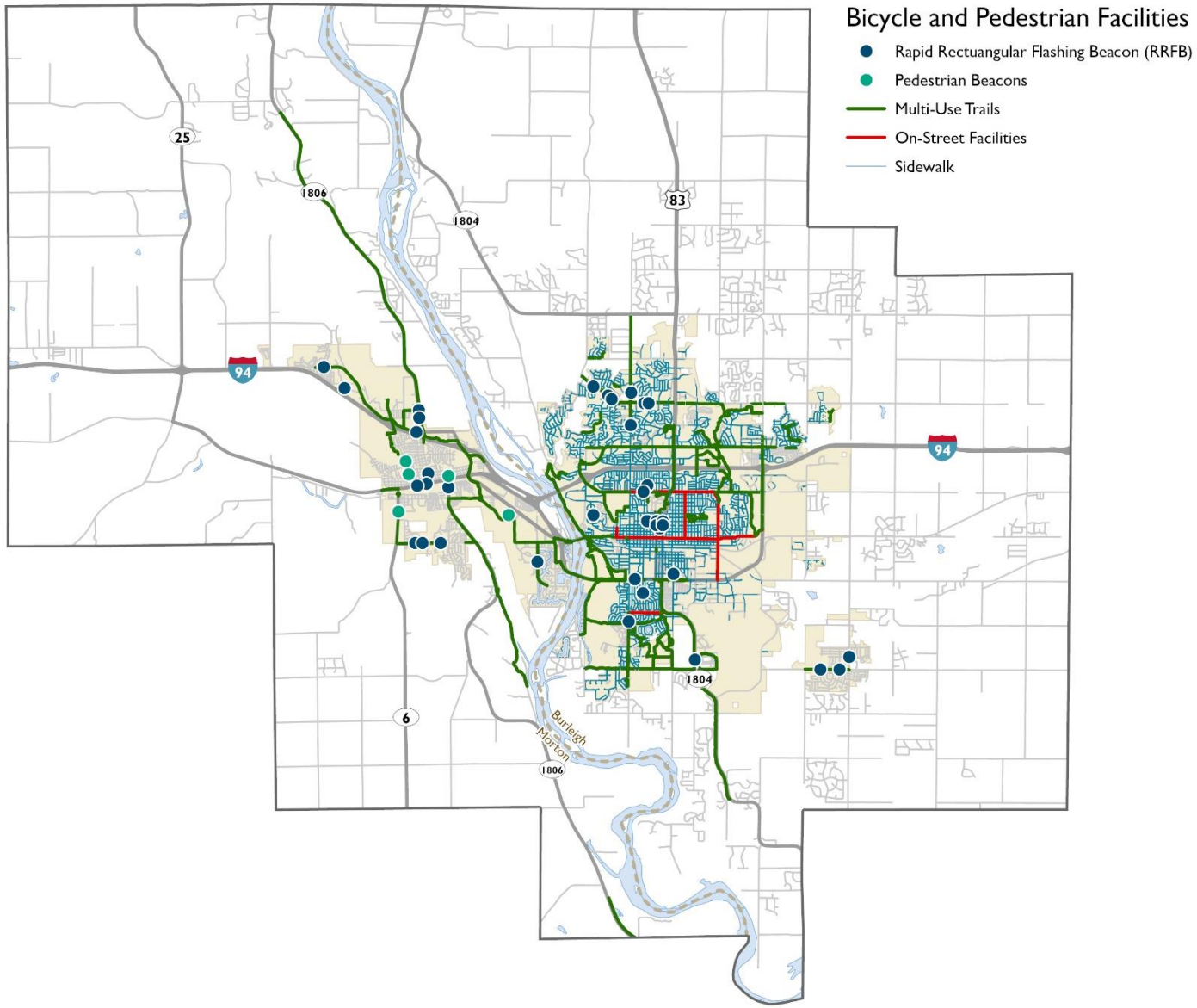
Existing Bicycle and Pedestrian Facilities

Today, the existing bicycle and pedestrian infrastructure found within the Bismarck-Mandan MPO Region consists of off-street facilities that provide infrastructure separated from vehicular traffic and on-street facilities that are located within the roadway adjacent to vehicular travel lanes. The off-street facilities that exist today include sidewalks and multi-use trails while the on-street facilities include bicycle lanes and shared road routes. In addition to these facilities, a number of Rapid Rectangular Flashing Beacons (RRFBs) are found throughout the region. A description of each of these facilities is in **Table 16** and their locations within the MPO region are shown in **Figure 42** and **Figure 43**.

Table 17: Existing Bicycle and Pedestrian Infrastructure within the Bismarck-Mandan MPO Area

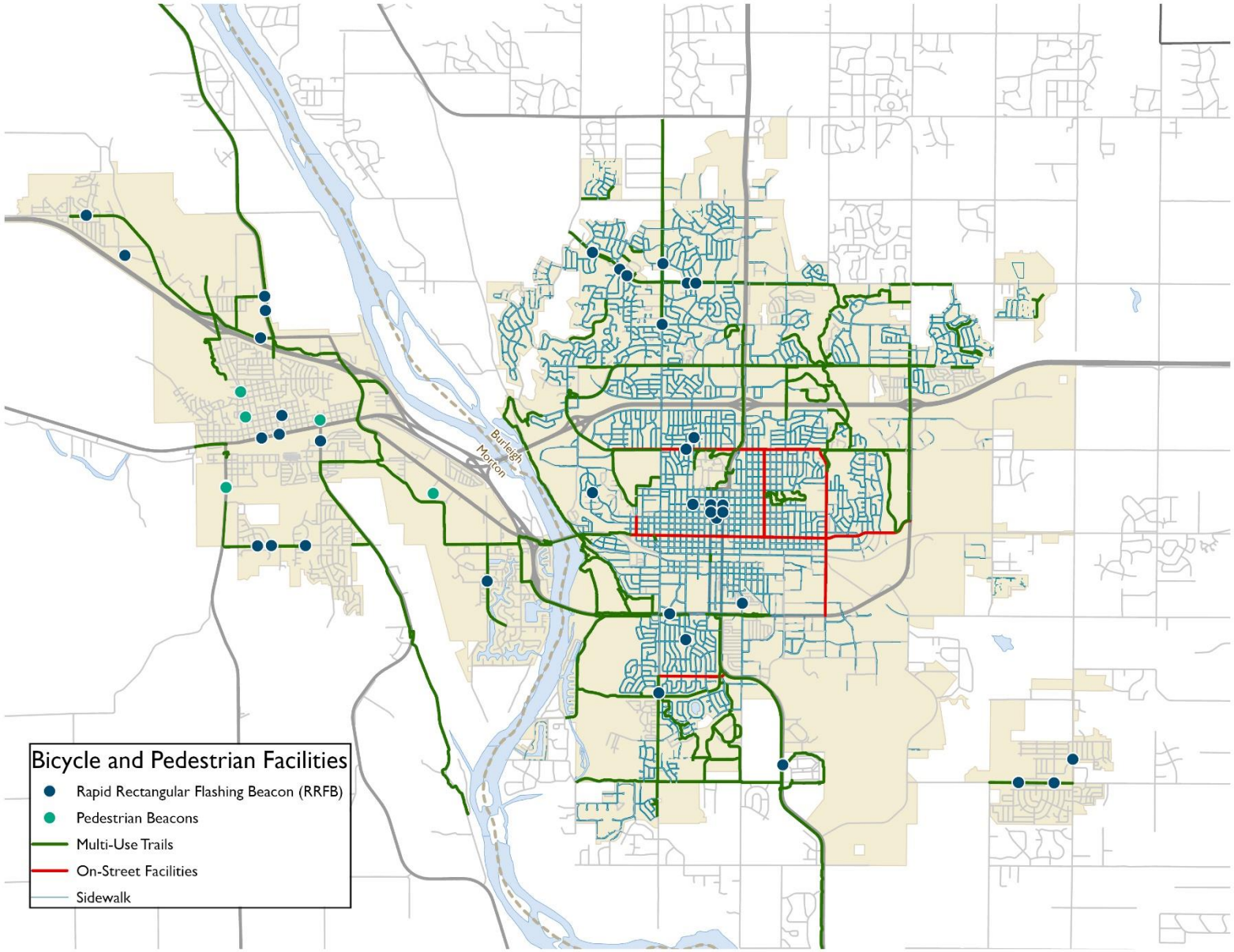
Facility Type	Description
Sidewalks 	A paved pedestrian facility is located along a street. Sidewalks are located on most streets in Bismarck and are typically located on both sides of the street once a property is developed.
Multi-Use Trails 	Trails are separated from the roadway and used for bicycling, walking, running, or other non-motorized activities. There are multi-use trails in both Bismarck and Mandan. Many of these trails continue past city limits into Morton and Burleigh County.
Bicycle Lanes 	A dedicated portion of roadway space for preferential or exclusive use by bicyclists. Some roads in Bismarck include dedicated bicycle lanes, which are between 4 and 6 feet wide and marked with paint.
Shared Road Routes 	Lower speed and lower volume roads that use signage and lane markings to indicate the roadway space is intended to be shared by all users. Some residential and collector roads in Bismarck are marked with Share the Roads signs and/or street markings to encourage motorists to make space for bicyclists.
Rapid Rectangular Flashing Beacons (RRFBs) 	Rapid Rectangular Flashing Beacons (RRFBs) are crossing treatments applied at uncontrolled, marked crosswalks that provide flashing lights as indicators to alert motorists of pedestrian usage of the crossing.

Figure 41: Existing Bicycle and Pedestrian Facilities



Source: City of Bismarck, City of Mandan, Morton County, February 2024

Figure 42: Existing Bicycle and Pedestrian Facilities



Transit System

Public transit service in the Bismarck-Mandan MPO region is provided by Bis-Man Transit. More information on Bis-Man Transit's history and structure is available in the 2023 update to its Transit Development Plan, which guides transit service and investment. Below is a summary of existing conditions drawn from that plan.

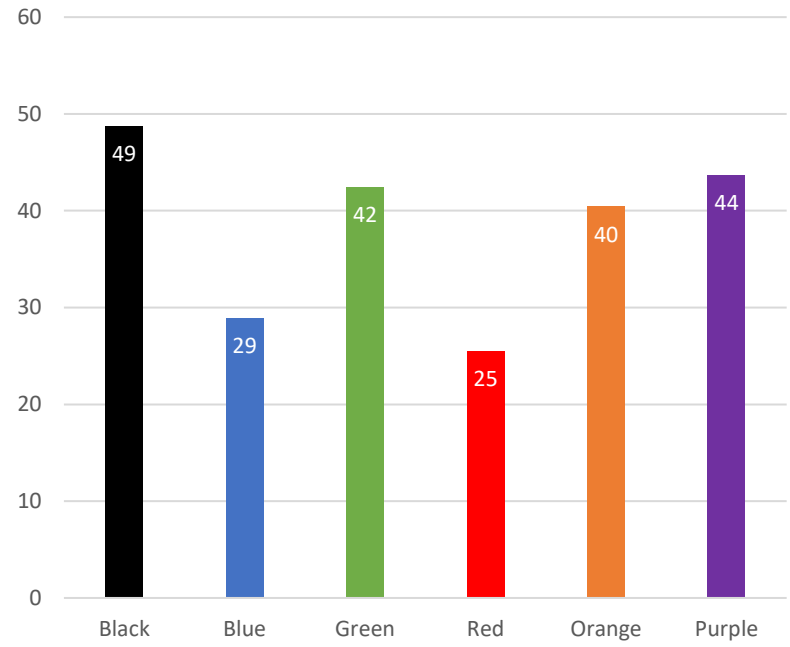
Fixed-Route Service

Capital Area Transit (CAT) operates fixed-route service in the MPO region. CAT operates six regular fixed routes on weekdays and Saturdays. Weekday service runs from 6:30 AM to 7:00 PM and Saturday service starts an hour later at 7:30 AM. Four of the routes operate on an hourly pulse schedule, with all buses arriving at the same time at a stop on Front Avenue and departing ten minutes later. The exceptions are the Purple Route to Mandan, which serves this stop every two hours, and the Red Route, which provides hourly service to the north end of Bismarck between Bismarck State College and North 14th Street/Mapleton Avenue. The routes are shown in **Figure 45**.

As **Figure 44** shows, ridership varies by route. The Black Route has the highest ridership in the system, with 49 boardings on an average weekday. The Red Route has only about half that ridership, at 25 average boardings. The Purple Route has the second-highest ridership in the system despite its limited schedule.

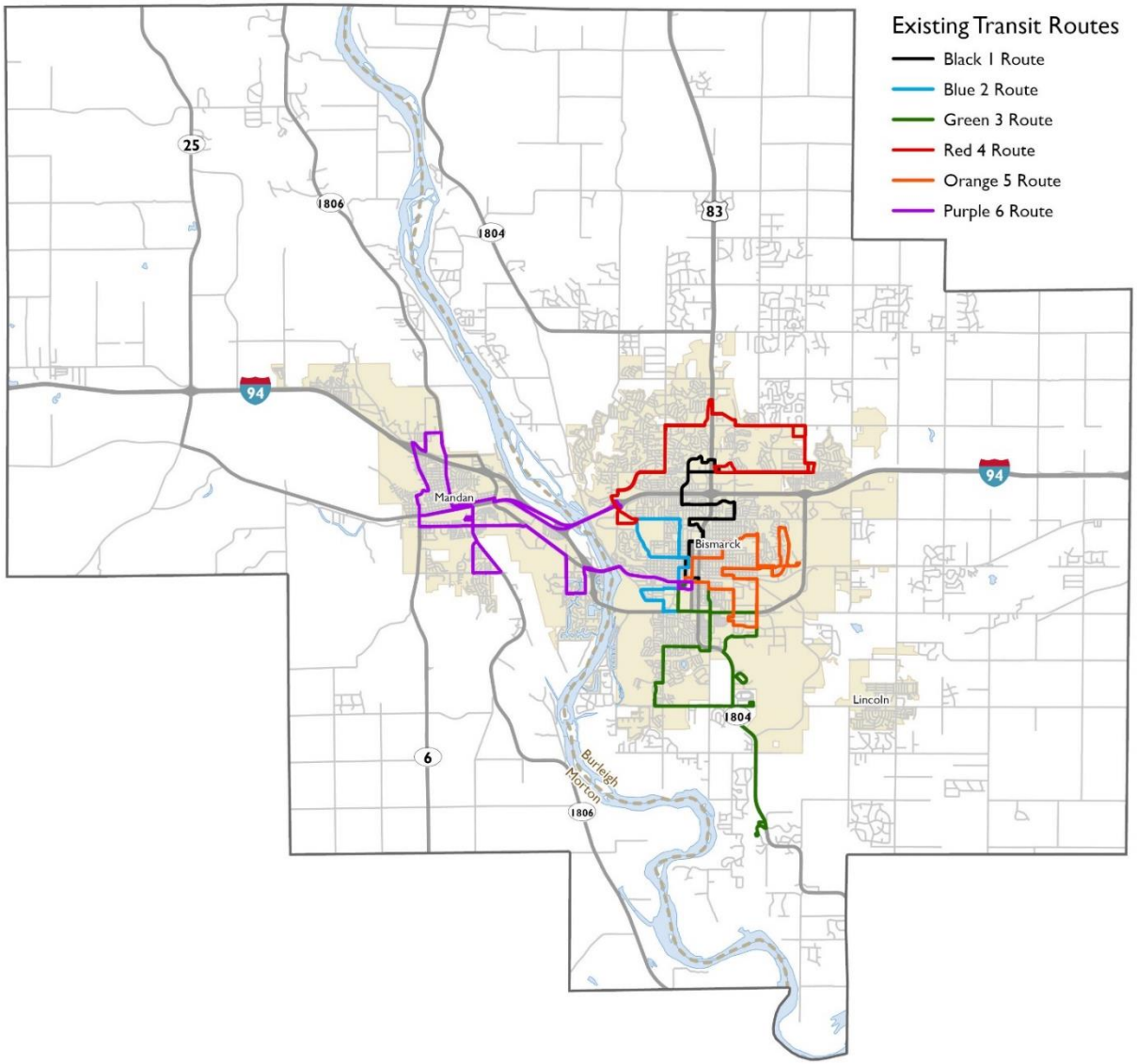
Table 17 shows several key operating statistics reported by Bis-Man Transit for its fixed-route service over five years. Both revenue hours and passenger trips dipped in 2020. Revenue hours recovered to pre-pandemic levels, while passenger trips did not.

Figure 43: Average Weekday Boardings by Route (August 2021 – July 2022)



Source: Bismarck-Mandan, *2023 Transit Development Plan*

Figure 44: Current Fixed-Route Network



Source: Capital Area Transit

Table 18: Fixed-Route Service Indicators, 2017-2021

Service Indicator	2017	2018	2019	2020	2021
Revenue Hours	24,146	21,340	20,811	18,400	21,707
Passenger Trips	98,646	107,172	102,538	55,445	56,744
Operating Expenses	$1,610,875	$1,574,148	$1,558,069	$1,420,374	$1,699,835
Passenger Revenue	$66,516	$78,141	$74,006	$51,884	$50,929
Operating Expense Per Passenger Trip	$16.33	$14.69	$15.20	$25.62	$29.96
Operating Expense Per Revenue Hour	$66.71	$73.77	$74.87	$77.19	$78.31
Passenger Trips Per Revenue Hour	4.09	5.02	4.93	3.01	2.61
Average Fare Per Passenger Trip	$0.67	$0.73	$0.72	$0.94	$0.90
Operating Ratio	4%	5%	5%	4%	3%
Subsidy Per Passenger Trip	$15.66	$13.96	$14.47	$24.68	$29.06

Source: Bismarck-Mandan, *2023 Transit Development Plan*

Paratransit Service

Paratransit door-to-door services are available to senior citizens 70 years of age or older and to individuals with any type of certifiable disability. This service operates within the city limits of Bismarck, Mandan, and Lincoln; on the U-Mary campus; and within three-quarters of a mile from fixed-route service. Reservations can be scheduled for a specific pickup time (such as for a commute home from work), drop-off time (such as for a commute to work or an appointment), or for "will-calls," which send the first available bus for pickup using only approximate time windows.

Table 18 shows key service indicators for paratransit during the period between 2017 and 2021.

Table 19: Paratransit Service Indicators, 2017 – 2021

Operating Statistic	2017	2018	2019	2020	2021
Revenue Hours	45,012	40,047	38,615	28,715	28,950
Passenger Trips	147,332	121,520	108,609	71,635	86,203
Operating Expenses	$2,151,561	$2,288,926	$2,537,027	$2,070,486	$2,111,094
Passenger Revenue	$443,872	$331,958	$303,168	$168,945	$249,680
Operating Expense Per Passenger Trip	$14.60	$18.84	$23.36	$28.90	$24.49
Operating Expense Per Revenue Hour	$47.80	$57.16	$65.70	$72.10	$72.92
Passenger Trips Per Revenue Hour	3.27	3.03	2.81	2.49	2.98
Average Fare Per Passenger Trip	$3.01	$2.73	$2.79	$2.36	$2.90
Operating Ratio	21%	15%	12%	8%	12%
Subsidy Per Passenger Trip	$11.59	$16.10	$20.57	$26.54	$21.59

Source: Bismarck-Mandan, *2023 Transit Development Plan*

Historic Fixed-Route and Paratransit Ridership

Fixed-route and paratransit ridership have followed the same trends in recent years (**Figure 46**). Boardings declined from 2017 to 2019, fell sharply in 2020 due to the COVID-19 pandemic, and recovered slightly over the course of 2021-2022. Paratransit consistently generated more than half of each year's total boardings.

Fleet and Facilities

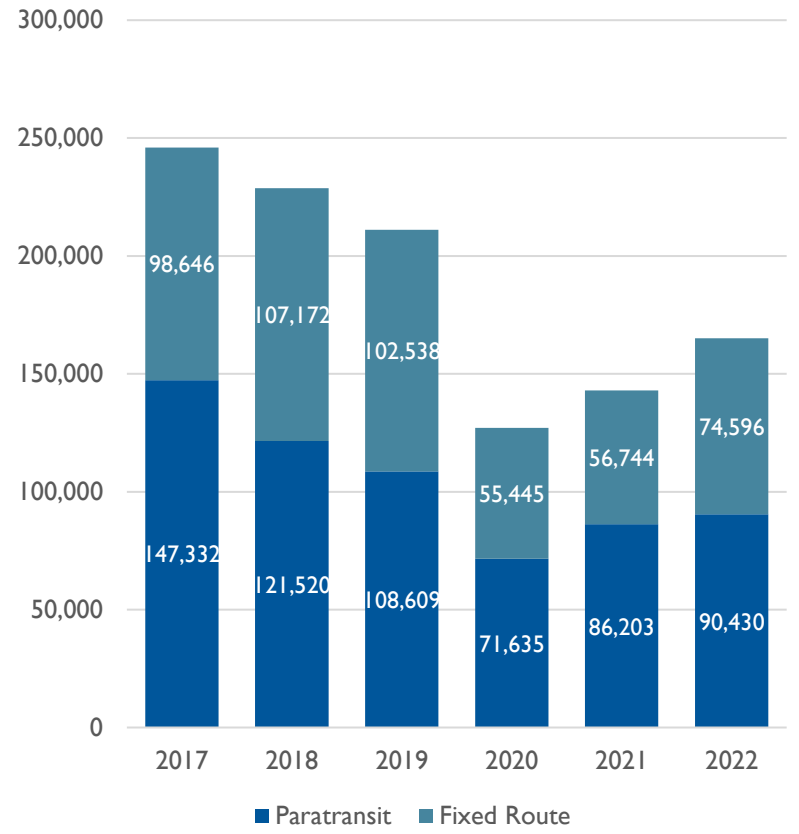
Bis-Man Transit operates 10 heavy-duty buses to provide service on its six fixed routes. The fleet also includes 18 medium- and light-duty cutaway buses and two vans for paratransit service.

All CAT routes except the Red Route depart from and return to the bus shelter at 500 Front Avenue. The Purple Route departs alternately from Front Avenue and from a second transfer point with a shelter at Bismarck State College. Of all locations served by CAT routes, the Bis-Man Transit Facility (served by the Orange 5 Route) is the only site with additional amenities, such as restrooms, vending machines, and bus pass purchase options. The Bis-Man Transit Board holds regular monthly meetings in this building, and the facility also serves as the agency's bus depot.

Coverage

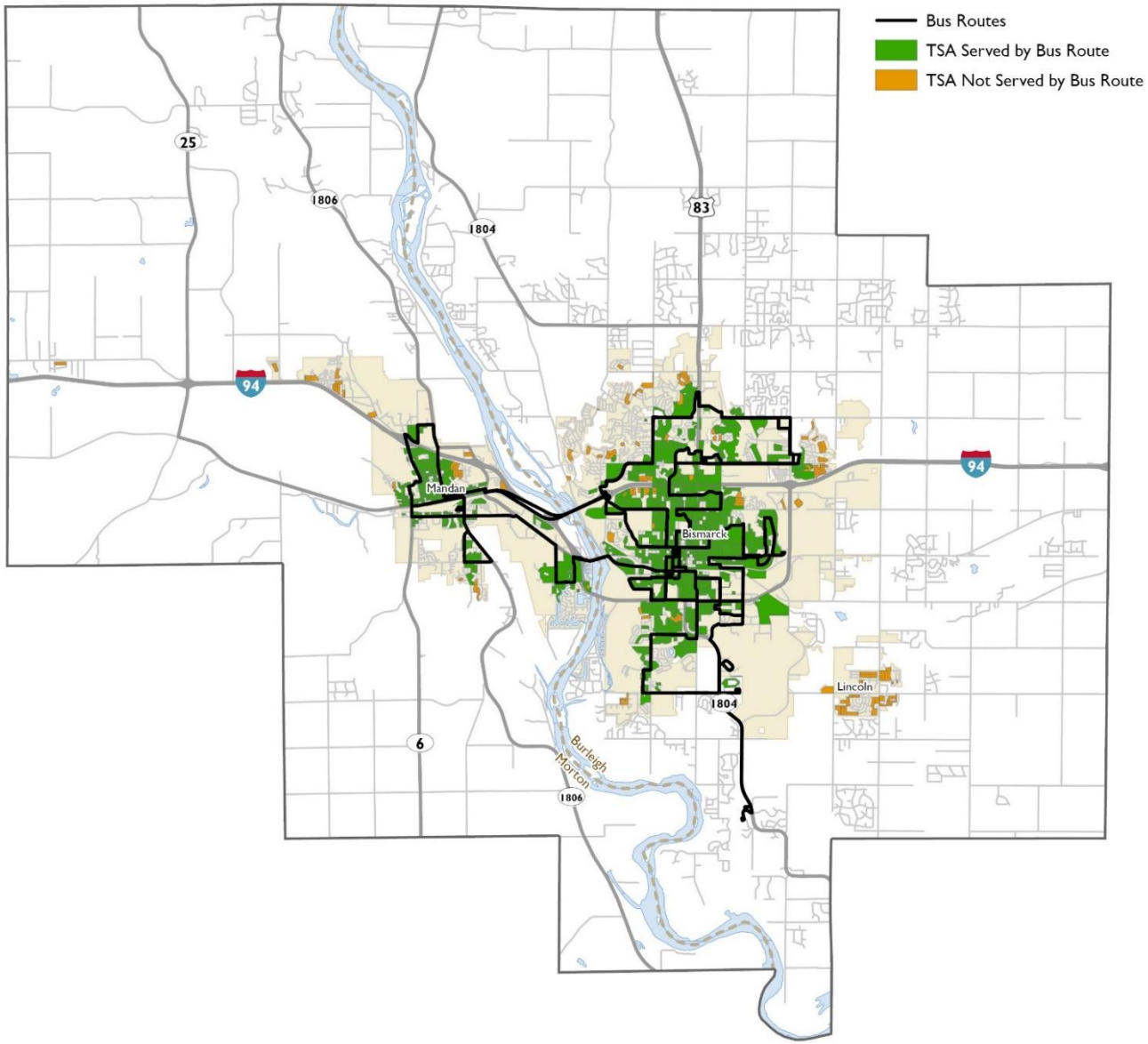
The fixed-route network currently covers 90 percent of the area considered transit-supportive on the basis of its housing density, job density, or both. **Figure 47** displays transit-supportive census blocks in green if they are within a quarter-mile of bus service and orange if they are not.

Figure 45: Ridership by Mode, 2017 – 2022



Source: Federal Transit Administration, National Transit Database

Figure 46: Transit-Supportive Areas



Source: Bismarck-Mandan, *2023 Transit Development Plan*

Regional Connections

Regional connections are additional transportation modes that support mobility and the regional economy through helping people, goods, and services move through the MPO area. The key modes facilitating regional connectivity include intercity bus service, passenger rail, aviation, waterways, pipelines, and alternate mobility providers such as Transportation Network Companies (TNCs), bikeshare, and electric scooters.

Intercity Bus Service

Current intercity bus service is provided by Jefferson Lines, who operates two routes that connect to the MPO area. These routes include:

- **East-West Route**: Service along I-94 beginning in Fargo and traveling east with stops in Valley City, Jamestown, Bismarck, and Dickinson
- **North-South Route**: Service along U.S. 83/U.S. 12/ND 1806 from Agar, South Dakota and serving stops in Fort Yates, North Dakota, and Bismarck.

Jefferson Lines' routes within the state of North Dakota are shown in **Figure 49**.

Users of Jefferson Lines service within the Bismarck-Mandan MPO Area can board at a stop located at the Bis-Man Transit Board on E Rosser Avenue in downtown Bismarck. Tickets are available for purchase at this site.

Passenger Rail

Passenger rail service is currently not offered in the MPO area. The nearest passenger rail station, operated by Amtrak, is located in Minot, North Dakota which is located approximately 100 miles north of the Bismarck-Mandan area.

Figure 47: Jefferson Lines Routes within North Dakota

Source: Jefferson Lines

Passenger Aviation

Passenger aviation services are available at two locations within the MPO area—the Bismarck Municipal Airport and the Mandan Regional Airport.

Bismarck Municipal Airport

The Bismarck Municipal Airport is found within southern Bismarck, on ND 1804 and University Drive. Allegiant, American Airlines, Delta, and United provide round trip commercial service to locations including Chicago, Dallas/Fort Worth, Orlando/Sanford, Denver, Las Vegas, Minneapolis/St. Paul, and Phoenix/Mesa.[7] **Figure 50** summarizes historic enplanements for commercial service at the Bismarck Municipal Airport.

As **Figure 50** indicates, passenger enplanements increased each year between 2015 and 2019 before experiencing a sharp decline in 2020 due to the COVID-19 public health pandemic. Enplanements began to trend towards pre-COVID-19 levels in 2021 and are expected to continue increasing in the future.

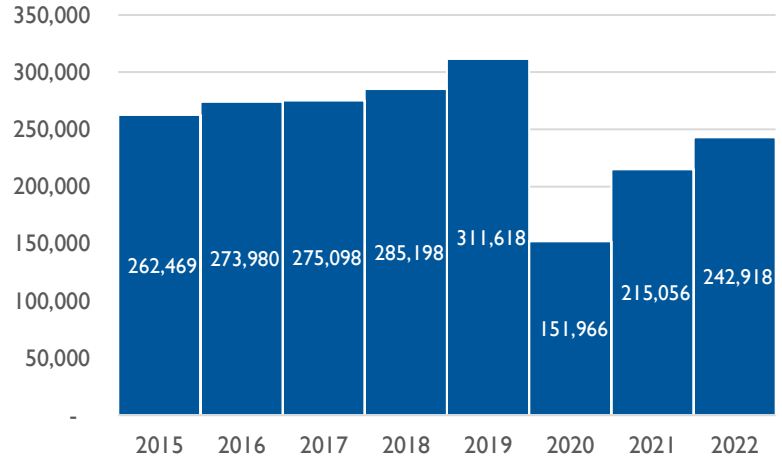
Mandan Regional Airport

The Mandan Regional Airport, located south of Mandan city limits, is one of North Dakota's busiest general aviation facilities. The facility averages 70 flights per day, with 60 percent of flights being general aviation, 33 percent transient general aviation, 2 percent military, and 4 percent air taxi.[8]

Operational statistics for the Mandan Regional Airport, sourced from the City of Mandan include:

- **Aircraft based on the field**: 99
    - Single engine airplanes: 89
    - Multi-engine airplanes: 4
    - Jets: 2
    - Helicopters: 1

Figure 48: Historic Passenger Enplanements for the Bismarck Municipal Airport, 2015 – 2022



Source: Federal Aviation Administration, Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports

Source: Bismarck Airport

[7] Bismarck Airport, *Master Plan Update*

[8] City of Mandan, North Dakota, *Mandan Regional Airport-Lawler Field*

Water Trails

Currently, there are no designated water trails within the MPO region. While not designated as a water trail, the segment of the Missouri River within the MPO region is a popular destination for recreational activities such as kayaking.

Alternate Mobility Providers

Alternate mobility providers refer to a broad range of emerging transportation modes that have been implemented throughout the United States and offer new ways for users to meet their travel needs. Examples of alternate mobility providers include Transportation Network Companies (TNCs) like Uber and Lyft, carsharing, bike share programs, electric scooters, and vanpool programs. Several alternate mobility providers currently operate in the Bismarck-Mandan MPO Area and are effective transportation options that provide users with critical first and last mile service that supports transit and active transportation users with mobility to begin and complete their trips.

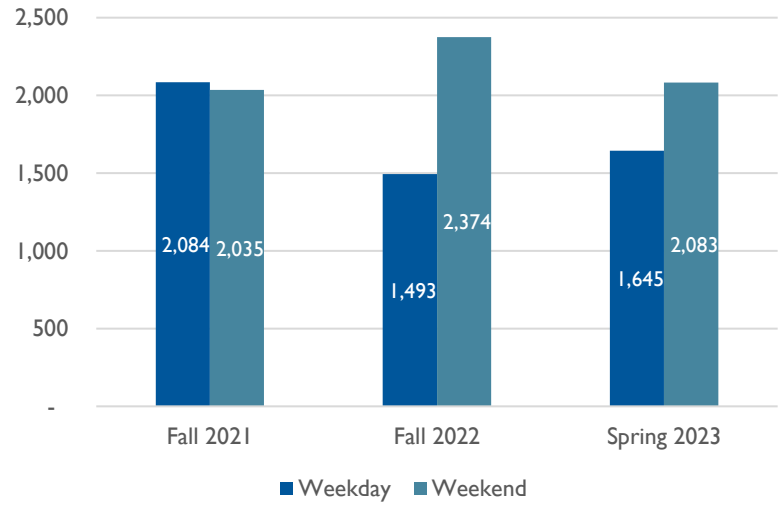
Transportation Network Companies

TNCs provide on-demand transportation services to users. Taxicabs are an example of a traditional TNC and have been operated in communities throughout the country for decades. Due to technological advancement, most TNCs today operate through applications for mobile devices that match users who request a ride with a driver in real time. Within the MPO region, Uber, Lyft, Metro Taxi, and Taxi 9000 provide TNC services.

Data related to TNC usage within the region was sourced from Replica HQ and analyzed to understand trends related to the service, including total trips taken, TNC trip purposes, and time of departure for TNC trips. The data analyzed represents a typical weekday and typical weekend day in Fall 2021, Fall 2022, and Spring 2023.

Figure 51 summarizes the number of trips taken via TNCs and taxicabs on typical weekdays and weekend days in the MPO Area during Fall 2021, Fall 2022, and Spring 2023. Total trips taken on a typical weekday exceeded those taken on a typical weekend day in Fall 2021. In Fall 2022 the number of trips taken on a typical weekday saw a substantial decline while the number of trips taken on a typical weekday increased by over 300. By Spring 2023, the number of typical weekday trips increased while the number of typical weekend day trips declined towards Fall 2021 levels.

Figure 49: Total Trips Taken by TNC/Taxicab, 2021 – 2023



Source: Replica HQ

Purposes of trips taken via TNC or taxicab were analyzed to understand the usage of these modes. **Figure 52** illustrates TNC and taxicab trip purposes for a typical weekday in Fall 2021, Fall 2022, and Spring 2023 while **Figure 53** illustrates trip purposes for a typical weekend day during the same time periods.

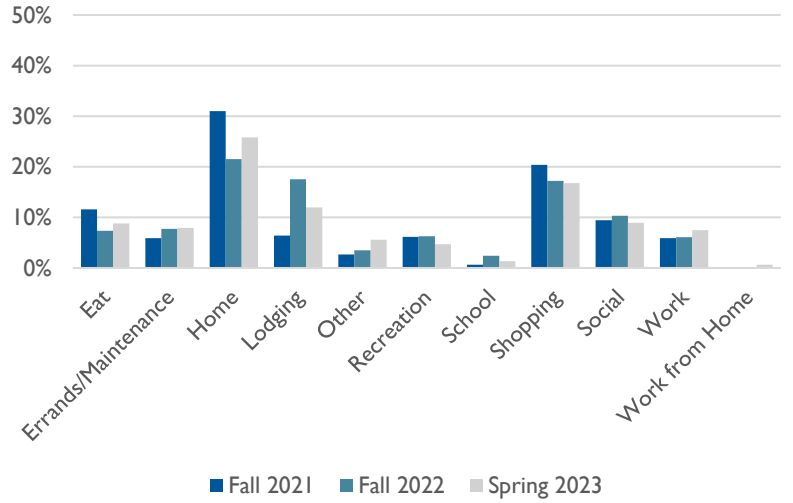
The most common purpose for TNC and taxicab trips on a typical weekday (**Figure 52**) in Fall 2021, Fall 2022, and Spring 2023 were to the trip taker's home. These trips peaked in Fall 2021 and represented just over 30 percent of all TNC and taxicab trips, before declining to 21 percent of trips in Fall 2022 and 25 percent of trips in Spring 2023.

Other common weekday trips made via TNCs and taxicabs included trips made for shopping, eating, and social purposes.

Purposes for trips made on a typical weekend day in Fall 2021, Fall 2022, and Spring 2023 (**Figure 53**) reflected the trends observed for typical weekdays as trips made home were the most common purpose overall. In Fall 2021, trips made home on a typical weekend day represented 16 percent of all TNC and taxicab trips and this proportion rose to 34 percent in Fall 2022 before increasing to 44 percent of trips in Spring 2023.

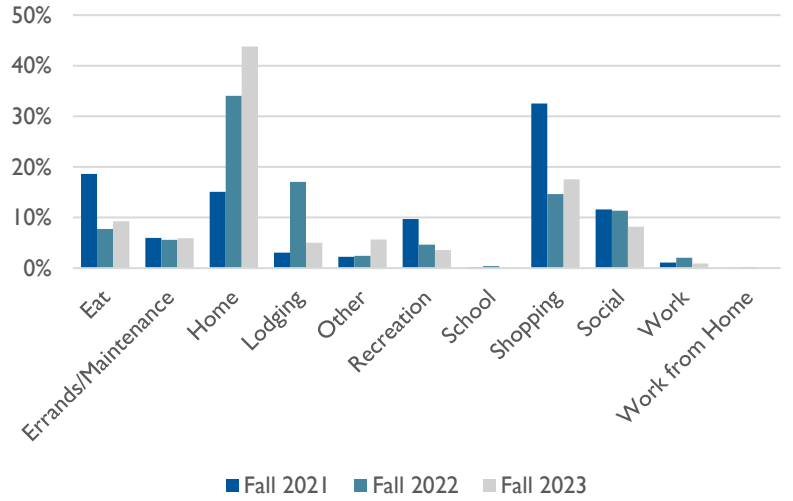
Other common weekend day trips made via TNCs and taxicabs included trips made for shopping, eating, and social purposes.

Figure 50: Purposes for Weekday TNC/Taxicab Trips, 2021 – 2023



Source: Replica HQ

Figure 51: Purposes for Weekend TNC/Taxicab Trips, 2021 – 2023



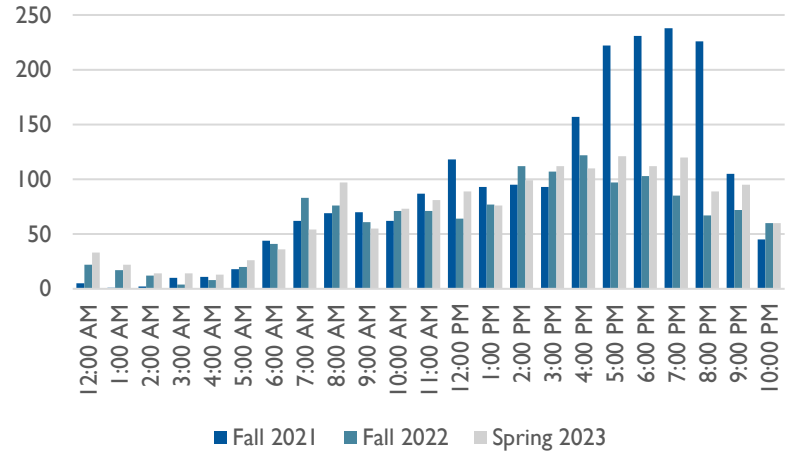
Source: Replica HQ

A third trend related to TNC and taxicab usage within the MPO Region looked at the time of departure for when these trips originated. Through understanding when TNC and taxicab trips are being taken, potential strategies, such as dedicating curb space for pick-ups and drop-offs, that address issues related to these modes can be identified. **Figure 54** summarizes time of departure for typical weekday TNC and taxicab trips while **Figure 55** summarizes time of departure for trips made on a typical weekend day.

The majority of TNC and taxicab trips made on a typical weekday in Fall 2021, Fall 2022, and Spring 2023 (**Figure 54**) were made in the afternoon and evening hours. In Fall 2021, trip departures were concentrated between the hours of 4 and 8 PM. For both Fall 2022 and Spring 2023, TNC and taxicab trips departed earlier in the day between the hours of 2 and 6 PM. The lowest proportions of TNC and taxicab trips taken on a typical weekday departed in the early morning between the hours of 12 and 5 AM.

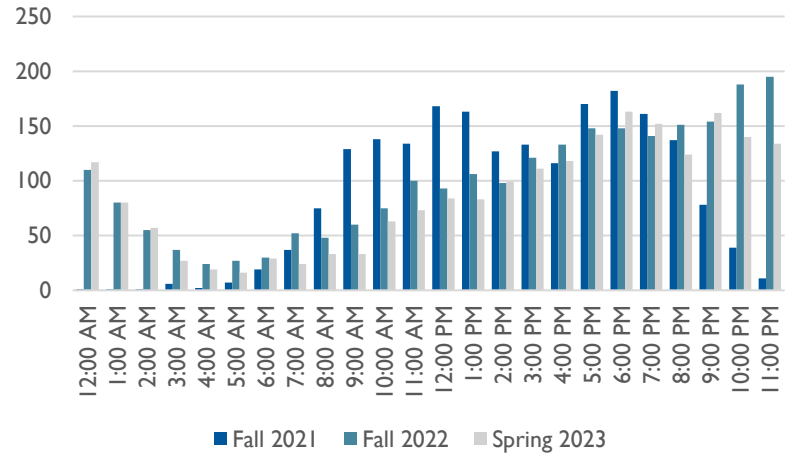
Time of departure for TNC and taxicab trips taken on a typical weekday in Fall 2021, Fall 2022, and Spring 2023 (**Figure 55**) were more spread out throughout the day when compared to a typical weekday during these time periods. In Fall 2021, the highest proportions of trips departed between 12 and 1 PM and 5 and 7 PM. Trips taken in Fall 2022 and Spring 2023 were concentrated during late the late evening hours of 8 and 11 PM. Compared to typical weekday trips, a larger number of weekend day trips departed in the early morning hours between 12 and 3 AM which reflects the usage of these modes for social purposes.

Figure 52: Time of Departure for Weekday TNC/Taxicab Trips, 2021 – 2023



Source: Replica HQ

Figure 53: Time of Departure for Weekend TNC/Taxicab Trips, 2021 – 2023



Source: Replica HQ

Bike Share

BisParks Bcycle is a bike share service operated in the city of Bismarck since 2020 and allows users the opportunity to rent a bicycle via an application available on mobile devices. Users can visit one of four stations and check out a bike that can be returned to any of the four stations once the user's trip is completed. The cost of a rental is $5 for the first hour and $.07 for each additional minute.

Bicycles can be checked out at any of the stations shown in **Figure 56** between the hours of 7 AM and 11 PM during the spring, summer, and fall months; the bike share service is suspended during winter months and the timeline for when the service is ended is contingent upon weather.

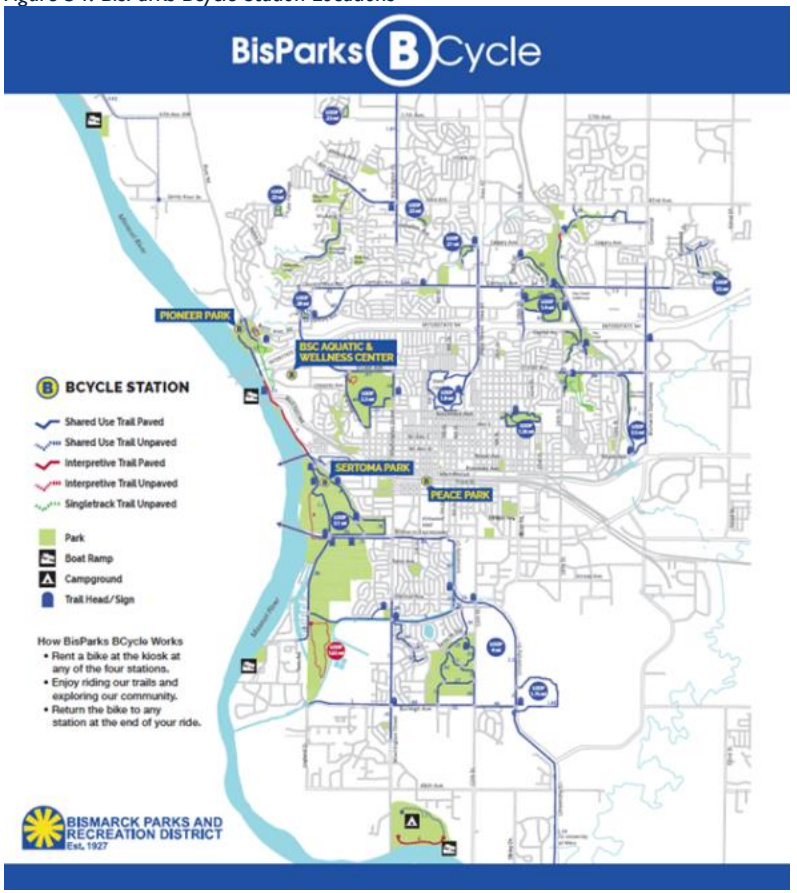
Scooter Share

Scooter share services have been an emerging alternate mobility mode that have seen implementation in many communities across the country in recent years. In 2021, the scooter share company Bird launched service in the city of Bismarck and is still in operation today.

The service is operated in a similar fashion to BisParks Bcycle; however, the scooter share service is dockless which means that users are free to return scooters to any location designated as a return zone rather than being required to return scooters to specific stations. Like BisParks Bcycle, users check scooters out via an application for mobile devices are charged on a per minute basis for the duration of their trip.

To accommodate the scooter share service, the Bismarck City Commission recently amended a city ordinance that prohibited the use of motorized scooters on public streets; the amended ordinance permits the use of motorized scooters on public sidewalks and streets with posted speeds of 30 miles per hour or less, as well as in bike lanes and sidewalks outside of the city's central business district.[9]

Figure 54: BisParks Bcycle Station Locations



Source: Bismarck Parks and Recreation District

[9] Bismarck Tribune, *Bismarck updates electric scooter ordinance after Bird scooter trial period*

Asset Conditions

Asset conditions refers to the MPO's roadway pavement and bridge infrastructure. This section of the report focuses on the existing conditions of the MPO's pavement and bridge assets.

Pavement Condition

In 2020, Bismarck-Mandan MPO roadways were surveyed for pavement condition. The "State of Streets" Final Report surveyed all functionally classified roadways in the City of Bismarck, collectors and arterials in the City of Mandan, and roadways selected by local staff in the City of Lincoln, Morton County, and Burleigh County. According to the 2020 report, roadways surveyed were found to be in overall "adequate" condition with an average Pavement Condition Index (PCI) of 80, refer to **Table 19**. The roadways were found to be in overall "smooth" condition, with an average International Roughness Index (IRI) of 185 inches/mile.

Table 20: Bismarck-Mandan MPO's Pavement Condition Categories

Category	Typical Distresses and Typical Level of M&R Needed	PCI Range
Adequate	More extensive longitudinal and transverse cracking and weathering of surface **Preventive maintenance:** *Crack sealing and surface treatments*	71-100
Degraded	Extensive longitudinal and transverse cracking, early-stage alligator (fatigue) cracking, early-stage rutting, and weathering of surface **Global preventive maintenance and localized repairs:** *Localized surface and/or full-depth patching, surface treatments, and thin overlays*	56-70
Unsatisfactory	More extensive and more severe longitudinal and transverse cracking, alligator (fatigue) cracking, rutting, weathering of surface, potholes **Major rehabilitation:** *Full-depth patching, mill and overlays, traditional overlays, and reconstruction*	0-55

Source: Bismarck-Mandan MPO, *2020 "State of the Streets"*

Table 21: Average Pavement Conditions by Jurisdiction

Jurisdiction	Centerline Miles	PCI	PCI Category	IRI	IRI Category
City of Bismarck	126.4	79.6	Adequate	196	Smooth
City of Lincoln*	1.4	80.4	Adequate	111	Smooth
City of Mandan	37.6	78.9	Adequate	243	Marginally Rough
Burleigh County	42.1	79.3	Adequate	125	Smooth
Morton County	14.9	89.3	Adequate	88	Smooth
Total	**222.3**	**80.0**	**Adequate**	**185**	**Smooth**

**Note*: The City of Lincoln's roadway inventory is managed by Burleigh County.

Source: Bismarck-Mandan MPO, *2020 "State of the Streets"*

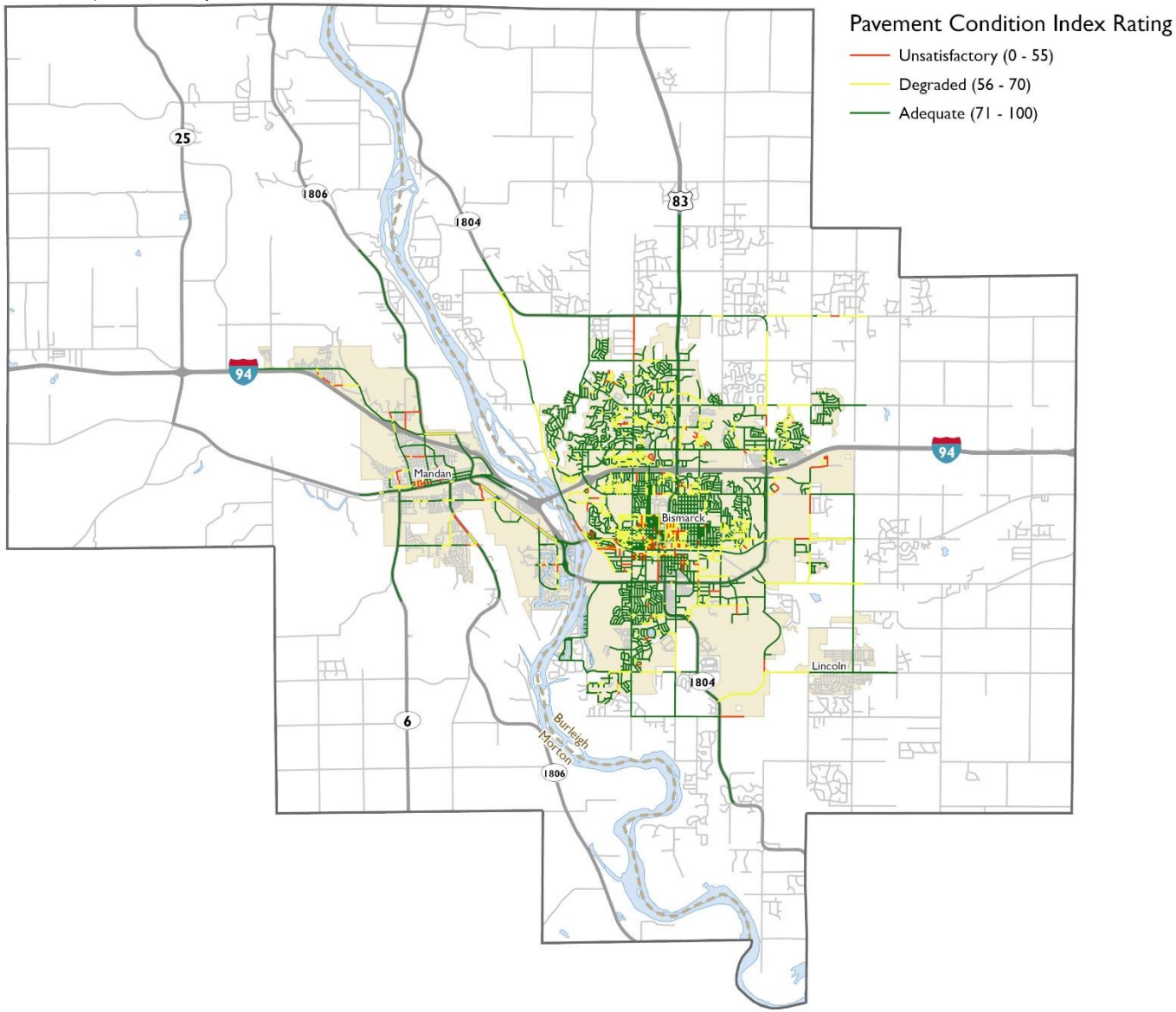
The North Dakota Department of Transportation (NDDOT) surveys the National Highway System (NHS) to record information related to pavement condition that is reported to FHWA per performance measure reporting guidelines. The most recent survey was performed in 2022. The 2022 pavement data sourced from NDDOT was used to calculate each NHS segment's Ride Quality Index (RQI) rating, which is a serviceability-performance concept that estimates the relative "roughness" experienced when driving along a roadway's pavement. RQI ratings range from "Very Poor" to "Very Good" using a 5-point scale:

- **Very Good**: RQI between 4.1 and 5.0
- **Good**: RQI between 3.1 and 4.0
- **Fair**: RQI between 2.1 and 3.0
- **Poor**: RQI between 1.1 and 2.0
- **Very Poor**: RQI between 0.0 and 1.0

The RQI ratings for NHS pavement within the MPO Area illustrate that most of the NHS was in Fair or better condition in 2022. It is noted that the NHS data used in the RQI analysis was collected in 2022 and does not represent the most recent pavement conditions for the MPO Area, as roadway reconstructions and rehabilitations that have occurred since 2022 have improved pavement conditions for certain NHS routes.

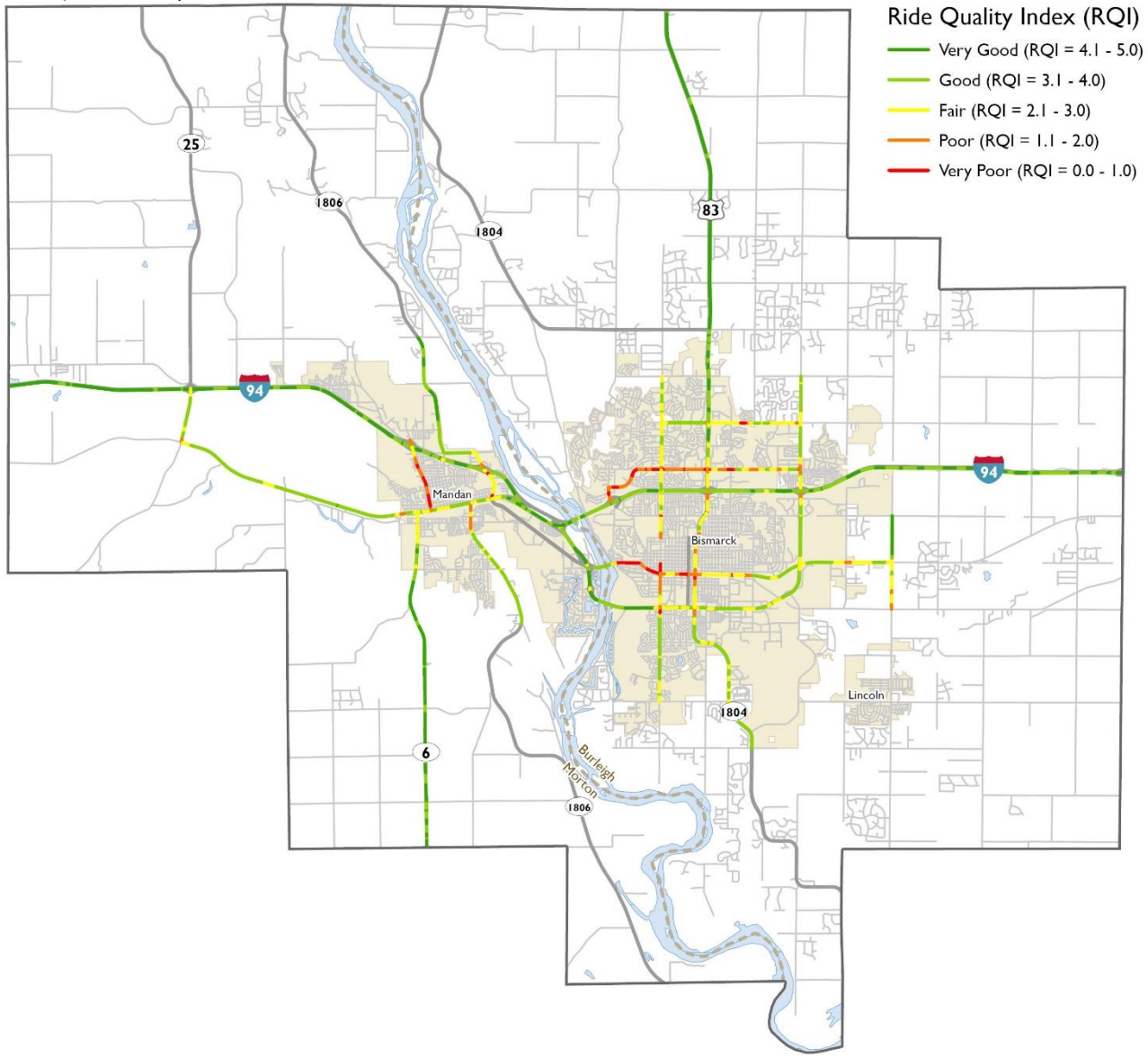
Figure 57 and **Figure 58** show pavement conditions for the MPO's local system and NHS, respectively. Pavement conditions for the local system are reported using PCI whereas pavement conditions of the NHS are reported using IRI.

Figure 55: Pavement Conditions for the Local System in the Bismarck-Mandan MPO Area



Source: Bismarck-Mandan MPO, City of Bismarck

Figure 56: Pavement Conditions for the NHS System in the Bismarck-Mandan MPO Area



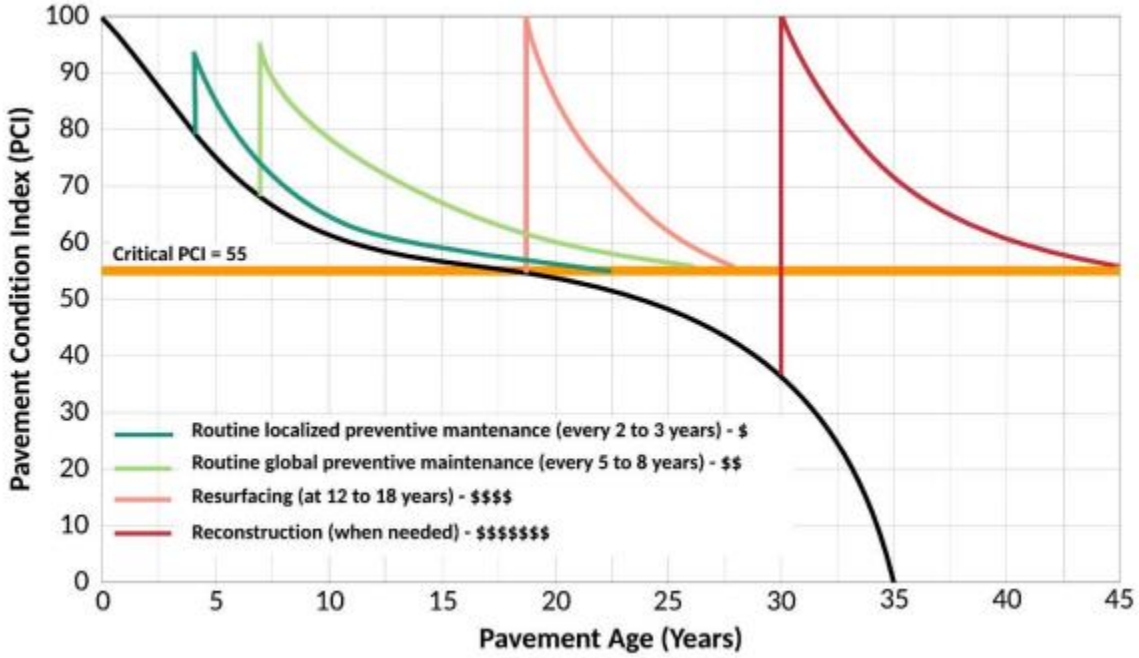
Source: North Dakota Department of Transportation

Pavement Management Strategies

The report found that M&R treatments (e.g., crack sealing, seal coats, and patching) were incorrectly applied as "stop-gap" or "cosmetic" treatments for pavements in poor condition rather than as true preservation activities. The appropriate preventive maintenance treatments should be applied to pavements that are in relatively good condition to increase the extent of the pavement service. This activity should be planned and applied systemically following either the resurfacing or reconstruction of a pavement, as shown in **Figure 59**.

The recommended findings from the report were based on an annual pavement deterioration rate from historical work records entered in PAVER and PCI inspection data. The BisMan MPO estimated pavement deterioration rate for asphalt roadways is roughly 2 points per year, equating to a pavement life between major rehabilitations of approximately 17.5 years. A deterioration rate of roughly 1 point per year was used for the concrete roadways, which equated to a pavement life between major rehabilitations of approximately 25 years.

Figure 57: Example of the Increasing Prices and Decreases Benefits of M&R



Source: Bismarck-Mandan MPO, *2020 "State of the Streets"*

Bridge Condition

Bridges are critical transportation assets the provide mobility in areas where geographic features such as rivers and rail lines create physical barriers. Given the importance of bridges in facilitating a healthy multi-modal transportation system, the MPO is tasked with reporting bridge conditions for those structures managed by state and local agencies.

Data provided by the National Bridge Inventory (NBI) was reviewed to determine the current condition of bridges and culverts located within the MPO region. The current condition of all bridges and culverts within the MPO region are summarized in **Table 21**, while **Table 22** provides the condition of bridges and culverts found on the Interstate or non-Interstate NHS. **Figure 60** shows the locations of the MPO's bridges and culverts by condition.

A total of 68 bridges and 25 culverts are found in the MPO region. Of these 68 bridges, over half are rated as being in Good condition, while 38 percent are considered to be in Fair condition. The remaining 3 percent are rated as being in Poor condition. MPO area culverts are all rated as being in either Good condition (44 percent) or Fair condition (56 percent).

For the bridges found on the Interstate or non-Interstate NHS, 45.7 percent are rated as being in Good condition while 54.3 percent are rated as being in Fair condition; no Interstate or non-Interstate NHS bridges are rated as being in Poor condition. For culverts found on the Interstate or non-Interstate NHS, 20 percent are rated as being in Good condition while the remaining 80 percent are in Fair condition.

Table 22: Condition of MPO Area Bridges and Culverts

Condition	MPO Area Bridges		MPO Area Culverts	
	Count	Percent	Count	Percent
Good	40	58.8%	11	44.0%
Fair	26	38.2%	14	56.0%
Poor	2	2.9%	0	0%
Total	68		25	

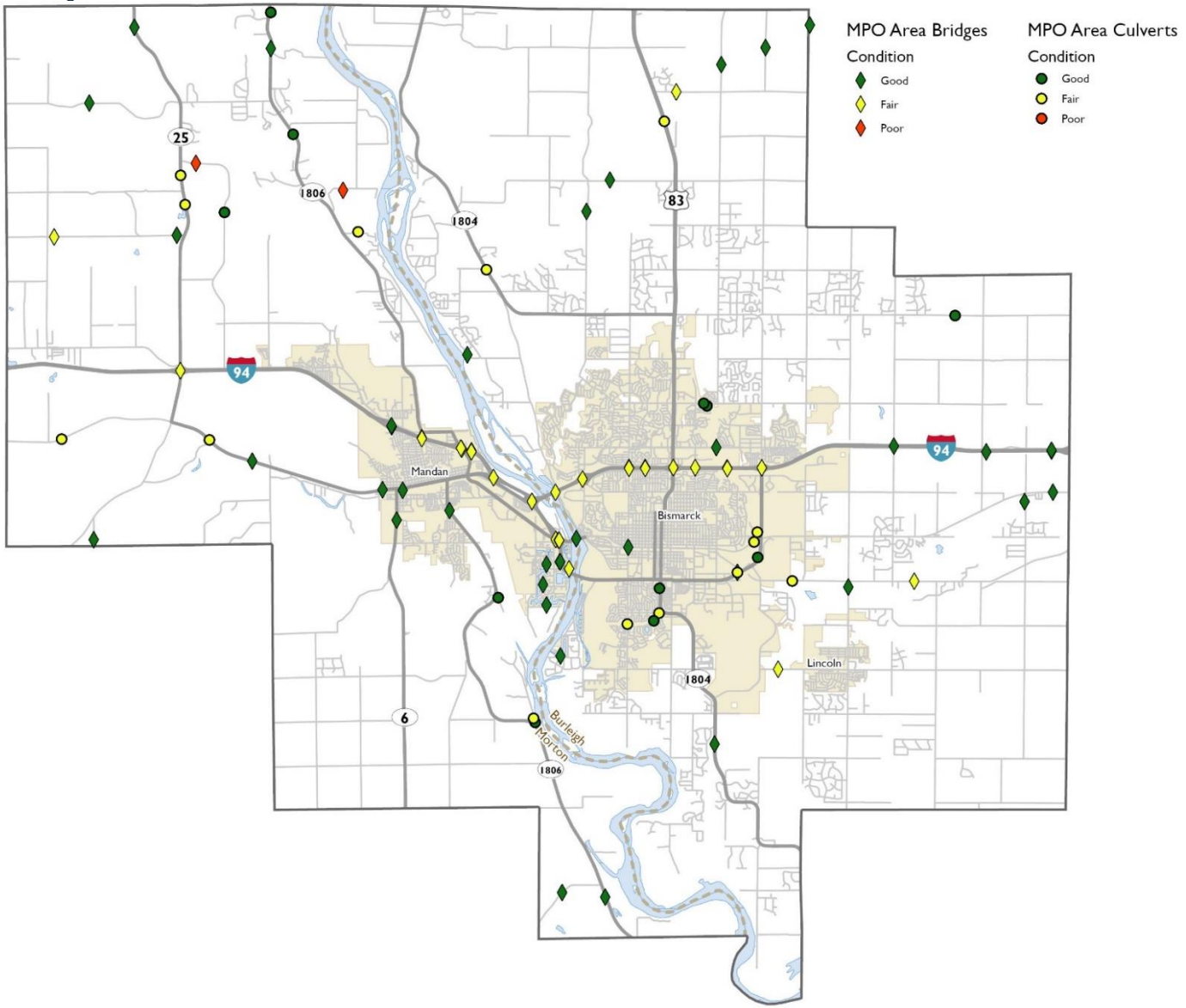
Source: National Bridge Inventory

Table 23: Condition of Interstate and non-Interstate MPO Bridges and Culverts

Condition	Interstate and non-Interstate NHS Bridges		Interstate and non-Interstate NHS Culverts	
	Count	Percent	Count	Percent
Good	16	45.7%	1	20.0%
Fair	19	54.3%	4	80.0%
Poor	0	0%	0	0%
Total	35		5	

Source: National Bridge Inventory

Figure 58: MPO Area Bridge and Culvert Conditions



Source: Federal Highway Administration, National Bridge Inventory

Several bridges within the MPO Area are load posted, meaning they have less load carrying capacity the originally designed for and prohibit vehicles over a certain size from using them. These bridges are a concern for the MPO and member agencies as further deterioration of these structures could result in additional load posting; should the agency responsible for the bridge not be able to provide ongoing maintenance of the structure, the bridge could be further posted until it is necessary to close the bridge for travel. Given the impacted carrying capacity of these structures, they are structures of concern for ensuring safe and efficient mobility for users.

In addition to the load posted bridges, one structure within the MPO Area was constructed prior to 1940. Due to the age of the bridge, which was built in 1914, its ability to safely support today's travelers could be impacted due to older design of the structure that includes a narrower deck than modern bridge standards require. This is currently owned by Burleigh County and stands as an additional bridge for the County to monitor to ensure safe and efficient mobility conditions for its users.

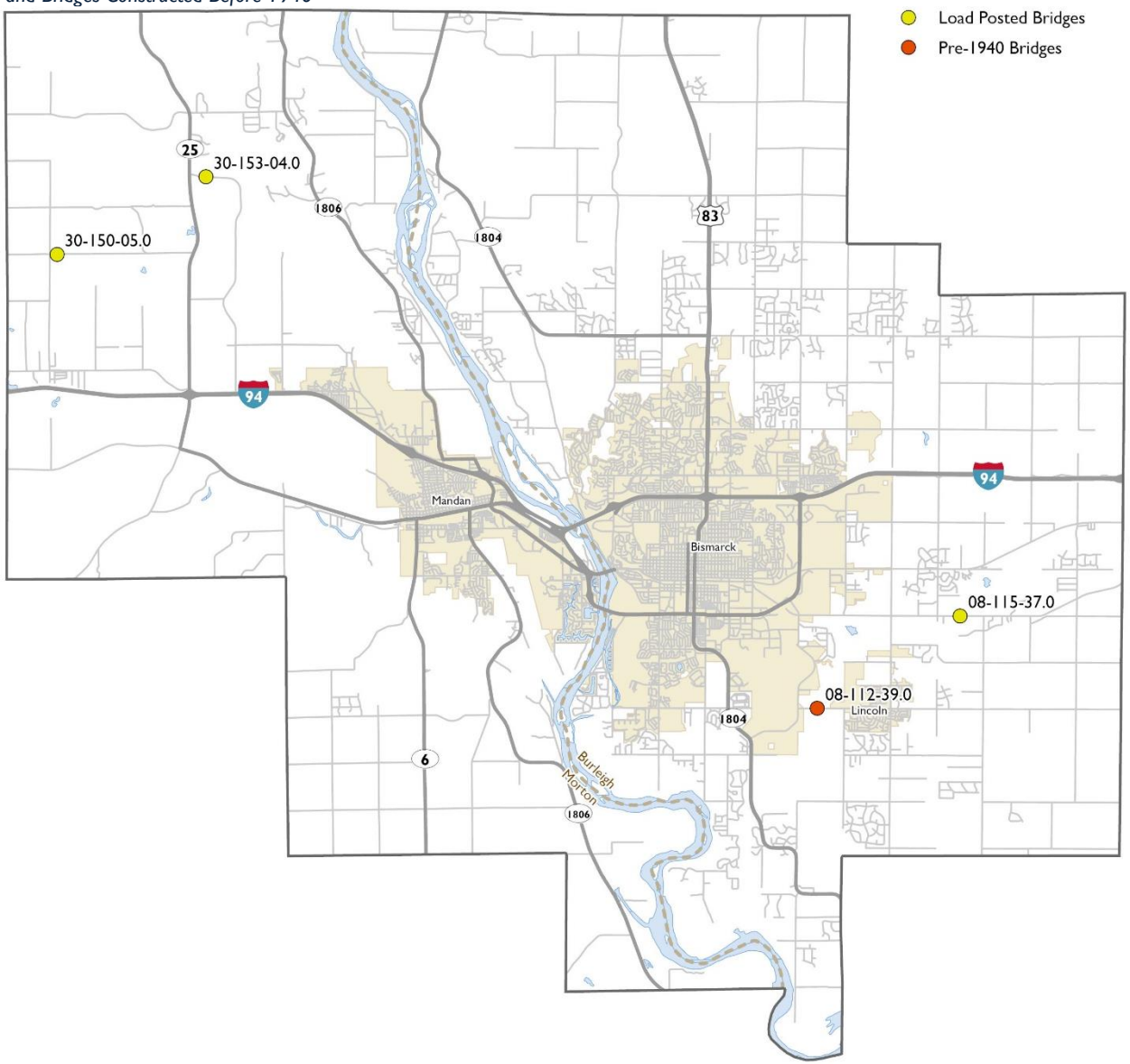
Table 23 provides detail on the three load posted bridges and the bridge constructed prior to 1940. **Figure 62** shows their locations within the MPO Area.

Table 24: Load Posted Bridges and Bridges Constructed Before 1940

Load Posted Bridges		
NDOT Structure Number	**Load Posting**	**Structure Owner**
08-115-37.0	37 Tons	Burleigh County
30-150-05.0	14 Tons	Morton County
30-153-04.0	19 Tons	Morton County
Bridges Constructed before 1940		
NDDOT Structure Number	**Construction Year**	**Structure Owner**
08-112-39.0	1914	Burleigh County

Source: North Dakota Department of Transportation

Figure 59: Posted Bridges and Bridges Constructed Before 1940



Source: North Dakota Department of Transportation

Environmental Review

A high-level screening of potential environmental resources that could be impacted from future transportation improvements was conducted so that potential alternatives can avoid negatively impacting them, or appropriate mitigation strategies can be identified.

Archaeological and Historical Resources

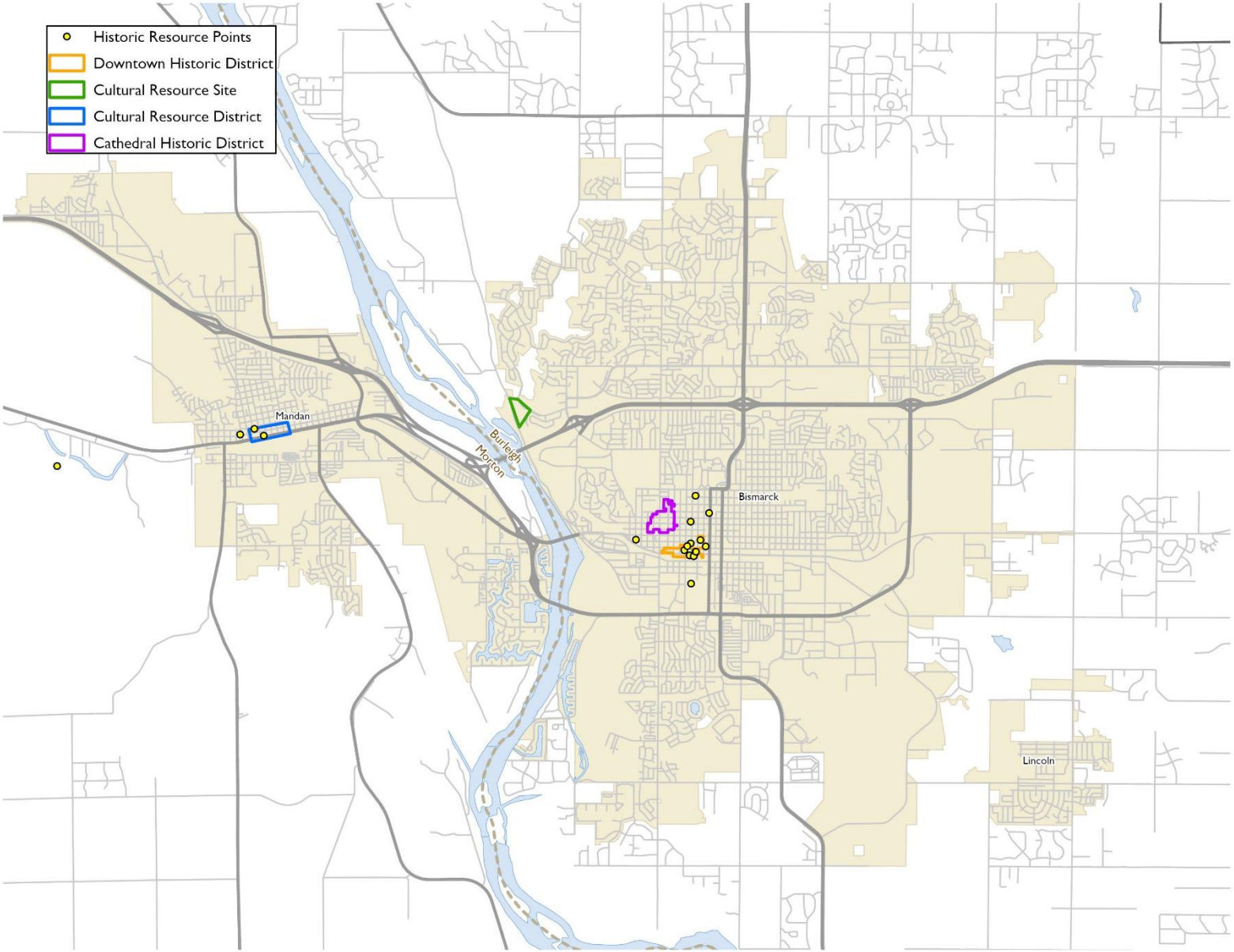
There are for historic and cultural resources to be present within the Bismarck-Mandan MPO Area. Historic and cultural resources are regulated under Section 106 of the National Historic Preservation Act and may require coordination with NDDOT and consultation with the North Dakota State Historic Preservation Office (SHPO). **Figure 62** identifies areas listed on the National Register of Historic Places or known historic districts. In addition to known listed sites, other cultural resources may be present and regulated under Section 106.

Three cultural resource districts are present within the Bismarck-Mandan MPO Area. Downtown Mandan is home to the Mandan Commercial Historic District. The Downtown Historic District and the Cathedral Historic District are close by each other in downtown Bismarck. There are numerous cultural resource buildings within the study area found in both districts. A few include the locations of the former Welsh House, the Lewis and Clark Hotel, the Sunnyside Farm Barn, the former North Dakota Executive Mansion, the Bismarck Civic Auditorium, and the Northern Pacific Railway Depot, and several other blocks, houses, buildings, and schools as shown in **Figure 62**.

Early in project planning, the jurisdictional entity should notify NDDOT and SHPO of its intent to proceed with a particular roadway improvement project, and request that these agencies advise the jurisdiction on the applicability of Section 106, the need to identify consulting parties, and for a Class I cultural resource literature search. When appropriate, the jurisdiction should anticipate that a Class III identification effort will be conducted, including identification of archaeological, architectural, and traditional cultural properties subject to the effects of the project.

When historic properties are identified, the jurisdiction should anticipate that avoidance or mitigation of adverse effects to such properties may be required. Clarification of these procedures and the expectations of other participants in consultation can be addressed under the terms of a Programmatic Agreement among the parties to the agreement and that tailors the review process to the needs of the Mandan-Bismarck MPO's MTP.

Figure 60: Cultural Resources within the Bismarck-Mandan MPO Area


Historic Resource Points
Downtown Historic District
Cultural Resource Site
Cultural Resource District
Cathedral Historic District
Mandan
Burleigh
Morton
Bismarck
Lincoln

Wetlands and Waters of the U.S.

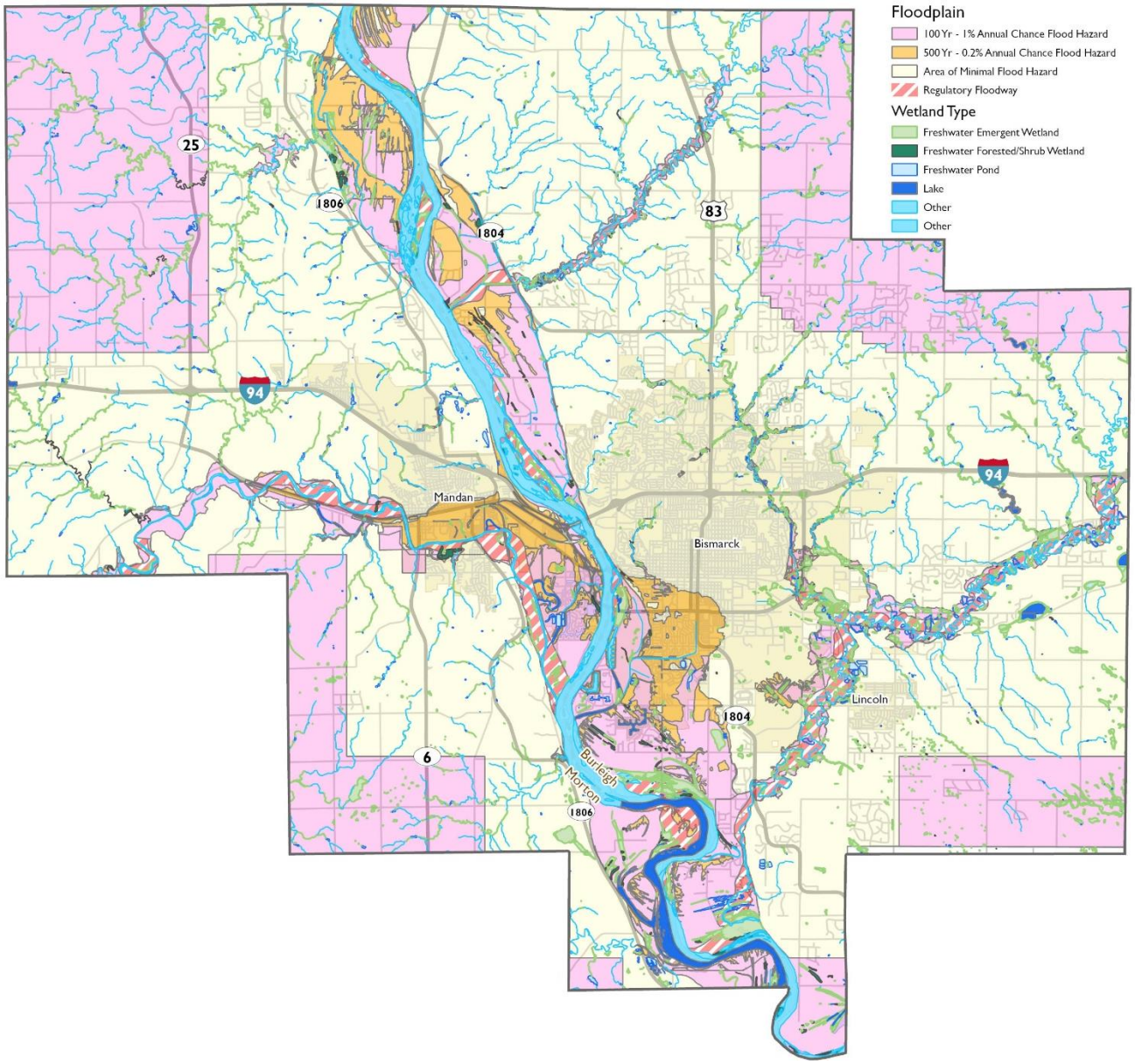
The National Wetlands Inventory (NWI) and aerial photography were reviewed within the MPO Area to determine potential aquatic resources that could be impacted through the implementation of future transportation improvements. The Missouri River (a large perennial river) runs north to south in the MPO Area. A few tributaries of the Missouri River flow out of the region, including Heart River, Square Butte Creek, Burnt Creek, and Apple Creek as shown in **Figure 64**. The creeks and river are likely jurisdictional and any work in the vicinity of those waterways will require a Section 404 permit.

Several smaller wetland areas also occur throughout the MPO Area. Most of the larger wetlands are in the southern and eastern portion of Burleigh County. These mostly include freshwater emergent wetlands and a few lakes. The Morton County side of the MPO Area contains streams that pass through Mandan city limits, as well as small lakes, ponds, and a reservoir. Scattered freshwater emergent wetlands and forested/shrub wetlands are found dispersed throughout the region (**Figure 64**). The area with the least amount of stream or wetland presence is the northwest corner of the MPO Area.

Floodplains

Figure 64 also identifies floodways, the 100-year floodplains, and 500-year floodplains occurring within the MPO Area. Regulatory floodway is found along portions of the west and east sides of the Missouri River and along portions of the Heart River, Burnt Creek, and Apple Creek. The 100-year floodplain is found along the Missouri River consistent with the river's curves and along the Heart River, Apple Creek, and parts of Burnt Creek, as well as the Harmon Lake area and portions around the edge of the MPO with numerous wetlands and streams. The 500-year floodplain occurs mainly along the Missouri River in the northern part of the MPO, as well as near its confluence with the Heart River and Burnt Creek. Notably, where the Heart River splits off from the Missouri River, there is a large area in Mandan and southern Bismarck of 500-year flood risk.

Figure 61: Aquatic Resources within the Bismarck-Mandan MPO Area



Threatened and Endangered Species

A review of potential threatened and endangered species within the MPO Area was completed using the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) for the study area. ESA-listed species occurring in Burleigh County, ND include the northern long-eared bat, whooping crane, piping plover, rufa red knot, and Dakota skipper. In Morton County, ND, listed species include the northern long-eared bat (listed as endangered), whooping crane (listed as endangered), piping plover (listed as threatened), rufa red knot (listed as threatened), Dakota skipper (listed as threatened), and monarch butterfly (listed as candidate). Critical habitat occurring within the Bismarck-Mandan MPO includes piping plover habitat, which is concentrated along the Missouri River.

the Section 4(f) and Section 6(f) Resources

The Department of Transportation Act (DOT Act) of 1966 included a special provision – Section 4(f) – which is intended to protect publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites. Similarly, Section 6(f) protects state and locally sponsored projects that were funded as part of the Land and Water Conservation Fund (LWCF).

Publicly owned parks and recreation areas are present within the Mandan-Bismarck MPO Area. Legion Park is next to the Heart River on the southwest side of Mandan. Cottonwood Park is on the south side of Bismarck just west of the airport. Bismarck also has several other parks, including Sertoma Park, the McQuade Softball Diamonds, Lions Park, and Elk Ridge Park. There are many other public parks and recreation areas available near both cities within the MPO. Public and private historical sites are also present in the downtown areas of both cities, as shown in **Figure 63**. There are also wildlife-related lands managed by USFWS within the eastern side of the region that are part of the Long Lake Wetland Management District and shown in **Figure 65**.

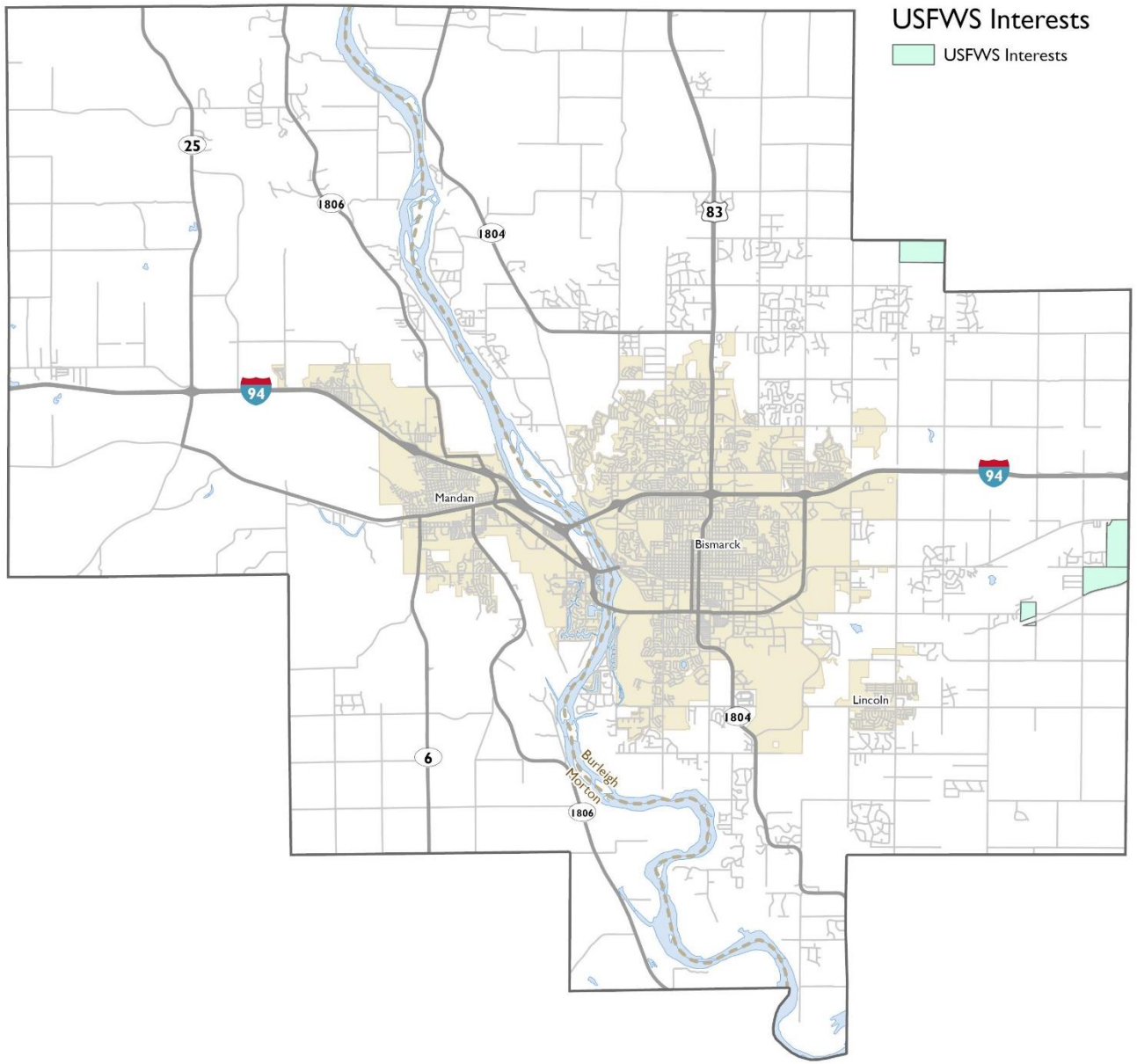
Lands managed by USFWS include Waterfowl Production Areas and wetland easements. Some of these lands have the potential to be protected under Section 4(f). and would need to be reviewed if potentially impacted by future projects. If the projects proposed receive Federal Highway Administration (FHWA) funds, the projects will be subject to Section 4(f) consultation.

Public spaces within the study area that have received LWCF grant money are subject to Section 6(f) regulations. Several grant funded parks are within the Bismarck-Mandan MPO and are detailed in **Table 24.**

Table 25: Grant Funded Parks within the Bismarck-Mandan MPO Area

County	Location	Park
Morton	Mandan Park District	Legion Park
Burleigh	Bismarck Park District	McQuade Softball Diamonds
Burleigh	Bismarck Park District	Hay Creek Park
Burleigh	Bismarck Park District	Lions Park
Burleigh	Bismarck Park District	Sertoma Park – Fitness Area
Burleigh	Bismarck Park District	Sertoma Park – Shelter 4 Playground
Burleigh	Bismarck Park District	Elk Ridge Park
Burleigh	Bismarck Park District	Cottonwood Park
Burleigh	Bismarck Park District	New Generations Park
Burleigh	Bismarck Park District	Neighborhood Park
Burleigh	Bismarck Park District	Lions Park – Hillside Aquatic Complex
Burleigh	Bismarck Park District	Municipal Ballpark

Figure 62: USFWS Interests



Environmental Justice

The EPA's Environmental Justice Screening (EJScreen) and Mapping Tool (Version 2.2) was used to determine socioeconomic indicators, pollution, and environmental justice indexes that occur within the study area. Socioeconomic indicators evaluated using the tool include demographic index, low income, and unemployment rates. According to the EJScreen tool, approximately 20% of the population of Bismarck-Mandan MPO falls within low income, which is slightly lower than the state average of 26%. The MPO project area is made up of 14% people of color/minorities, which is roughly the same as the state average of 16%. Based on this information, it is not anticipated that future projects would cause adverse impacts to minority populations. Additionally, the MPO project area has an unemployment rate of 3%. This matches the state average of 3% but is lower than the national average of 6%. Further review should be completed to confirm the presence of EJ populations during future project planning. (**Appendix A**).

Dykshoorn Park in the City of Mandan

Summary of Issues

The analysis of the existing multi-modal transportation system provides insight into the current issues and needs facing the Bismarck-Mandan MPO area. The issues and needs identified include:

Safety	Frequent crashes along the MPO's higher-volume arterial roadway network; crashes resulting in serious injury have been increasing in the region.
Traffic Operations	AM and PM peak hour congestion issues on the MPO's functionally classified system result in substantial delay, especially in downtown Bismarck.
Freight	The presence of high freight-generating land uses in eastern and southern Bismarck highlights the need to provide efficient connections between freight destinations and the region's highways and Interstate system.
Bicycle and Pedestrian	The existing bicycle and pedestrian network provides a strong foundation for future expansion that can further enhance the system connectivity while providing increased access to community destinations.
Transit	Transit ridership saw a significant decline in 2020, and ridership has begun to trend toward pre-2020 levels. Investment in transit-supportive improvements can accommodate increasing ridership will encouraging additional ridership in the future.
Pavement	Continued investment and management of the MPO's pavement assets can address condition deficiencies while preventing a decline in pavement conditions that would result in deterioration beyond an acceptable level.
Bridges	Several bridges are in poor condition today while others exhibit functional deficiencies that impact their ability to support usage by all types of vehicles. Improving these structurally and functionally deficient bridges can prevent load restrictions and/or closures in the future.

Appendix A
EJScreen Results

EPA

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

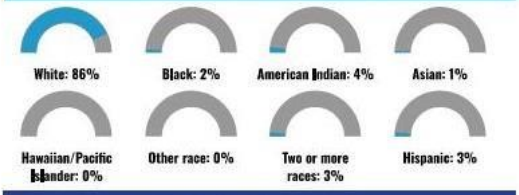
Bismarck, ND

the User Specified Area
Population: 119,564
Area in square miles: 394.14

A3 Landscape

COMMUNITY INFORMATION

BREAKDOWN BY RACE



BREAKDOWN BY AGE

LIMITED ENGLISH SPEAKING BREAKDOWN

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	96%
Spanish	2%
German or other West Germanic	1%
Total Non-English	4%

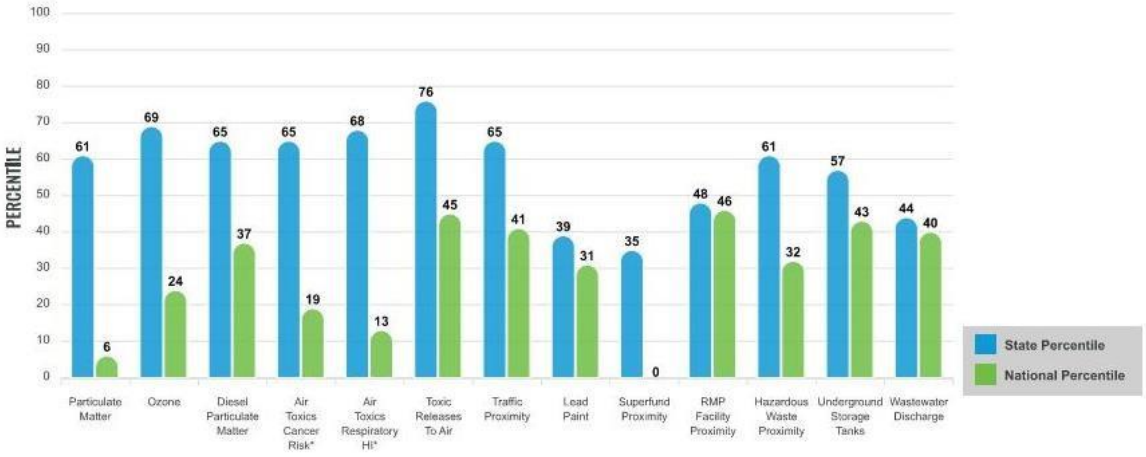
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

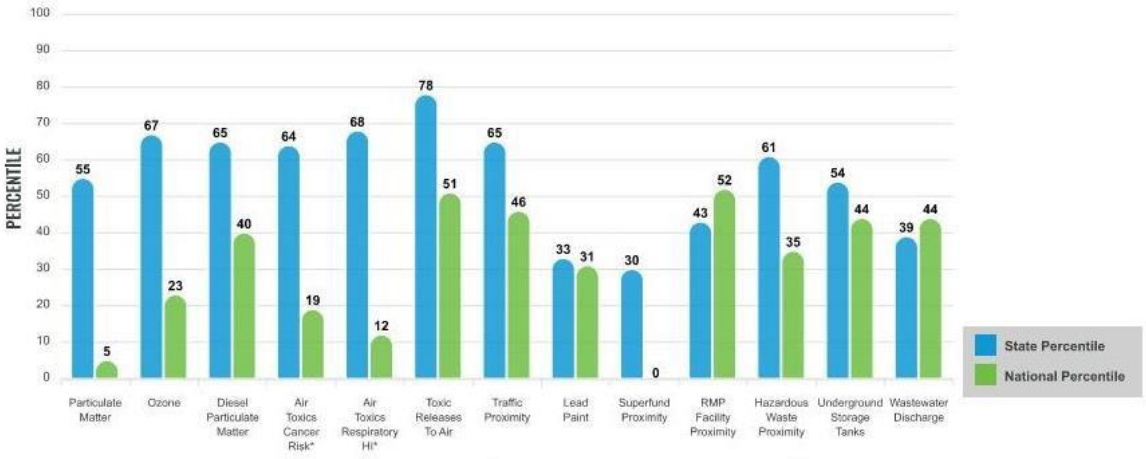
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for the User Specified Area

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu g/m^3$)	5.38	5.41	53	8.08	5
Ozone (ppb)	58.3	57.3	64	61.6	26
Diesel Particulate Matter ($\mu g/m^3$)	0.189	0.157	71	0.261	42
Air Toxics Cancer Risk* (lifetime risk per million)	20	16	0	25	1
Air Toxics Respiratory HI*	0.19	0.16	0	0.31	1
Toxic Releases to Air	1,800	460	95	4,600	71
Traffic Proximity (daily traffic count/distance to road)	110	85	72	210	59
Lead Paint (% Pre-1960 Housing)	0.16	0.29	37	0.3	43
Superfund Proximity (site count/km distance)	0.0029	0.0049	31	0.13	0
RMP Facility Proximity (facility count/km distance)	0.39	0.64	50	0.43	72
Hazardous Waste Proximity (facility count/km distance)	0.27	0.37	64	1.9	41
Underground Storage Tanks (count/km^2)	1.9	2.1	64	3.9	58
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.01	8.9	45	22	68
SOCIOECONOMIC INDICATORS					
Demographic Index	17%	21%	47	35%	24
Supplemental Demographic Index	9%	11%	38	14%	29
People of Color	14%	16%	59	39%	29
Low Income	19%	26%	37	31%	36
Unemployment Rate	3%	3%	62	6%	40
Limited English Speaking Households	1%	1%	79	5%	60
Less Than High School Education	6%	7%	50	12%	39
Under Age 5	6%	7%	54	6%	64
Over Age 64	16%	17%	48	17%	52
Low Life Expectancy	16%	18%	28	20%	21

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	2
Water Dischargers	302
Air Pollution	42
Brownfields	2
Toxic Release Inventory	10

Other community features within defined area:

Schools	44
Hospitals	4
Places of Worship	48

Other environmental data:

Air Non-attainment	No
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	Yes

Report for the User Specified Area

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	16%	18%	28	20%	21
Heart Disease	5.5	6.4	30	6.1	37
Asthma	9.3	9.3	65	10	33
Cancer	6.4	6.8	36	6.1	52
Persons with Disabilities	10.3%	11.8%	37	13.4%	34

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	7%	9%	48	12%	53
Wildfire Risk	58%	19%	85	14%	86

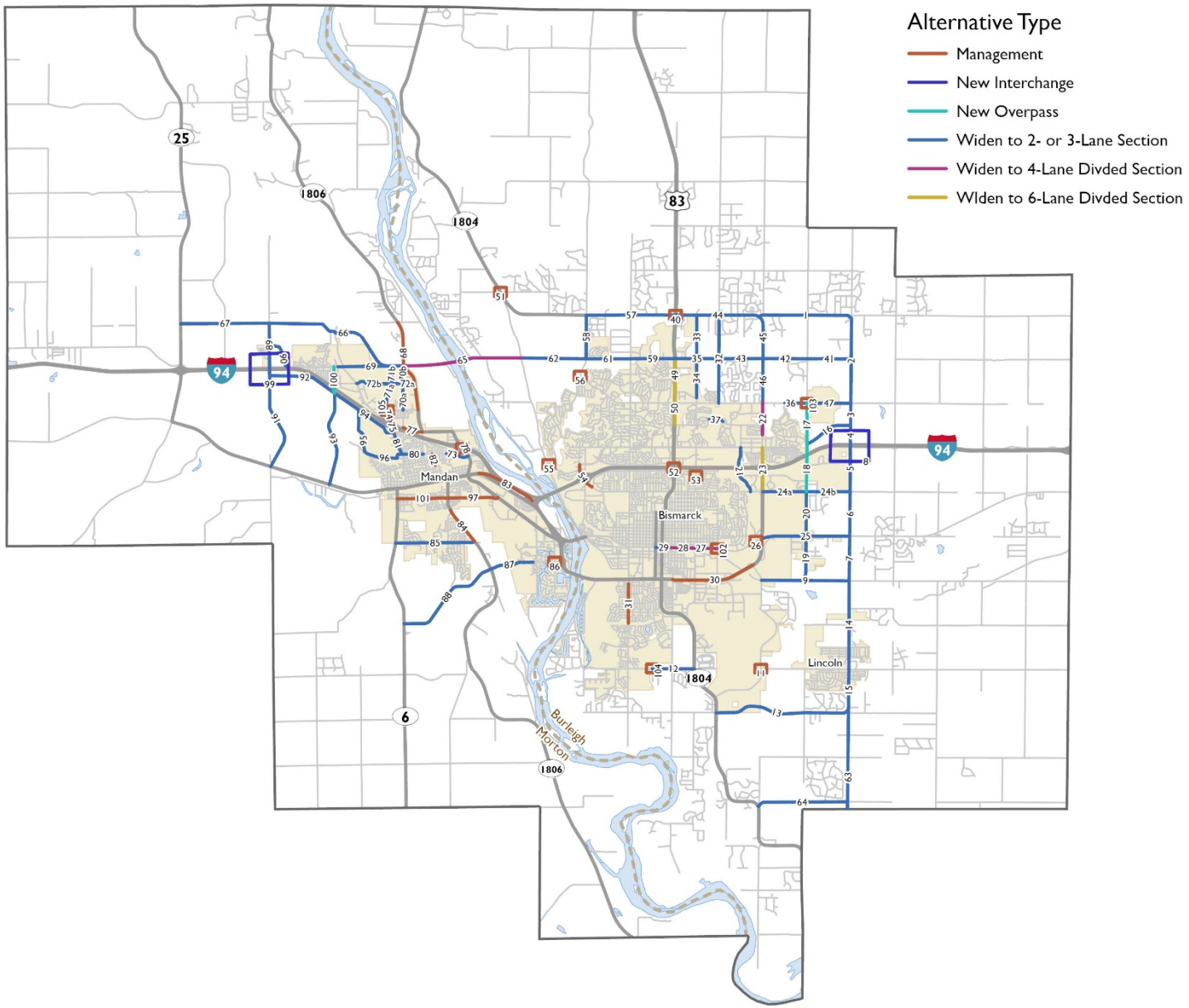
CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	13%	17%	40	14%	56
Lack of Health Insurance	5%	8%	38	9%	38
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Footnotes

Report for the User Specified Area

Appendix D: Alternatives Summary


Alternative Type
Management
New Interchange
New Overpass
Widen to 2- or 3-Lane Section
Widen to 4-Lane Divded Section
WIden to 6-Lane Divded Section
Mandan
Bismarck
Lincoln
Burleigh
Morton
25
1806
1804
83
94
6

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
1	71st Avenue	Centennial Road	66th Street	Reconstruct as a 3-lane rural section.	$18,744,000
2	66th Street	43rd Avenue	71st Avenue	Reconstruct/New Construct as a 3-lane urban section.	$27,690,000
3	66th Street	Century Avenue	43rd Avenue	Construct as 3-lane urban section (tied with project for interchange with I-94 at 66th Street).	$6,816,000
4	66th Street	I-94	Century Avenue	Construct as 3-lane urban section (tied with project for interchange with I-94 at 66th Street).	$6,390,000
5	66th Street	17th Avenue	I-94	Construct as 3-lane urban section (tied with project for interchange with I-94 at 66th Street).	$14,910,000
6	66th Street	Old Highway 10 / E Main Avenue	17th Avenue	Construct as 3-lane urban section (tied with project for interchange with I-94 at 66th Street).	$14,200,000
7	66th Street	Apple Creek	Old Highway 10/ E Main Avenue	Widen from 2-lane to 3-section.	$14,948,000
8	I-94	66th Street		New interchange.	$40,000,000
9	Apple Creek Road	Yegen Road	66th Street SE	Widen to 3-lanes and intersection capacity improvements at Yegen Road	$29,452,000
11	Lincoln Road	Yegen Road / Airway Avenue		Intersection capacity improvement.	$5,925,000
12	Burleigh Avenue	High Plains Road	University Drive	Widen to 3-lane urban section, consider roundabout at 12th St intersection	$15,612,000
13	48th Avenue S	University Drive	66th Street	Construct 2-lane rural section and structure improvements at Apple Creek crossing.	$7,560,000
14	66th Street	Lincoln Road	Northgate Drive	Widen from 2-lane to 3-section.	$20,276,000
15	66th Street	48th Avenue S	Lincoln Road	Reconstruct as 2-lane urban section.	$2,440,000
16	Century Avenue	52nd Street	66th Street	Construct 3-lane urban section.	$16,046,000
17	52nd Street NE	43rd Avenue NE	E Century Avenue	Widen from 2-lane to 3-lane section / build new 3-lane section.	$15,836,000
18	52nd Street NE	E Century Avenue	17th Avenue NE	I-94 overpass and street improvements from Century Ave to Divide Ave	$25,836,000

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
19	52nd Street	Apple Creek Road	Main Avenue	Widen to 3-lane urban section, consider roundabout at Highway 10 / Main Street intersection	$31,448,000
20	52nd Street	Main Avenue	17th Avenue	Widen to 3-lane urban section.	$14,224,000
21	Hamilton Street / Channel Drive	Divide Avenue	Century Avenue	Construct as 2-lane urban section with grade separation.	$28,770,000
22	Centennial Road	Jericho Road	43rd Avenue	Widen from 3-lane to 5-lane urban section.	$16,776,000
23	Bismarck Expressway / Centennial Road	Divide Avenue	Century Avenue	Widen from 5-lane to 6-lane section.	$28,600,000
24a	Divide Avenue	Bismarck Expressway	52nd Street	Construct as 3-lane urban section.	$14,800,000
24b	Divide Avenue	52nd Street	66th Street	Reconstruct 3-lane urban section.	$14,200,000
25a	Main Avenue	Bismarck Expressway	52nd Street	Widen from 2-lane to 3-lane section (including intersection improvement at 52nd Street).	$15,400,000
25b	Main Avenue	52nd Street	66th Street	Widen from 2-lane to 3-lane section	$15,400,000
26	Main Avenue	Hay Creek Crossing		Structural replacement.	$685,000
27	East Main Avenue	Airport Road	26th Street	Reconstruct as a 5-lane urban section	$11,271,000
28	East Main Avenue	12th Street	Airport Road	Reconstruct as a 5-lane urban section	$11,713,000
29	East Main Avenue	7th Street	12th Street	Reconstruct as a 5-lane urban section.	$7,956,000
30	Bismarck Expressway	12th Street	Yegen Road	Implement 3/4 access control at 5 intersections and add right turn at Airport Road.	$1,185,000
31	Washington Street	Drainage Channel	Denver Avenue	Turn lane improvements.	$924,300
32	26th Street	43rd Avenue	71st Avenue	Construct as 3-lane urban section.	$17,688,000

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
33	N 19th Street	57th Avenue NE	71st Avenue	Reconstruct 3-lane urban section.	$14,200,000
34	N 19th Street	Skyline Boulevard	57th Avenue NE	Reconstruct 3-lane urban section.	$12,496,000
35	57th Avenue	State Street	26th Street	Construct 3-lane urban section.	$14,058,000
36	43rd Avenue	N 26th Street	Roosevelt Drive	Resconstruct as 3-lane urban	$35,358,000
37	Calgary Avenue	DMVW Railroad	Pebbleview Loop/Koch Drive	Construct 2-lane urban section across DMVW RR with grade separation. (Low priority for MPO).	$50,690,000
40	71st Street	State Street		Intersection capacity and safety improvements.	$5,214,000
41	57th Avenue	52nd Street NE	66th Street	Pave 2-lane rural section	$6,534,000
42	57th Avenue	Centennial Road	52nd Street NE	Widen from 2-lane rural to 3-lane urban section, access control	$15,400,000
43	57th Avenue	26th Street	Centennial Road	Paving	$15,400,000
44	71st Avenue	State Street	Centennial Road	Widen to 3-lane section, consider roundabout at 26th Street intersection	$30,806,000
45	Centennial Road	57th Avenue	71st Avenue	Widen to 3-lane section.	$10,092,000
46	Centennial Road	43rd Avenue	57th Avenue	Widen from 2-lane to 3-lane rural section.	$15,400,000
47	43rd Avenue	52nd Street	66th Street	Widen to 3-lane urban section, consider a roundabout at 52nd Street	$24,646,000
49	State Street	Skyline Boulevard	57th Avenue	Widen to 6-lanes from N of Skyline Boulevard through 57th Avenue; intersection improvement at 57th. (Not preferred by NDDOT).	$21,450,000
50	State Street	Calgary Avenue	Skyline Boulevard	At grade improvements: Calgary Avenue and 43rd Avenue; widening to 6-lane urban section from Calgary Avenue through Skyline Boulevard intersection. (Not preferred by NDDOT).	$35,988,450
51	Burnt Creek Loop North / River Road	ND 1804		Intersection capacity improvement.	$5,925,000
52	State Street	I-94		Interchange reconstruction	$49,770,000

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
53	N 19th Street	Capitol Avenue		Intersection capacity improvement.	$1,777,500
54	Tyler Parkway	Schafer Road	Burnt Boat Drive	Intersection capacity improvement. Add turn lanes and include safety improvements.	$1,777,500
55	Apple Creek Road	Yegen Road		Intersection capacity improvement.	$11,850,000
56	Ash Coulee Drive	Tyler Parkway		Roundabout.	$3,000,000
57	71st Avenue/ ND 1804	15th Street/Tyler Parkway	State Street	Widen from 2-lane to 3-lane section.	$31,262,000
58	Tyler Parkway	57th Avenue	ND 1804 / 71st Avenue	Construct as 3-lane urban section.	$14,200,000
59	57th Avenue	Washington Street	State Street	Widen to 3-lane urban section, improve Washington Street intersection	$14,652,000
61	57th Avenue	Tyler Parkway	Crested Butte Road	Construct as 3-lane urban section.	$14,342,000
62	57th Avenue	River Road	Tyler Parkway	Construct as 3-lane urban section.	$20,874,000
63	66th Street SE	ND 1804	Woodrow Drive	Pave and improve to 2-lane rural section.	$15,576,000
64	76th Avenue SE	ND 1804	66th Street SE	Extend 76th Avenue SE, pave and construct 2-lane rural section.	$13,662,000
65	Northern Bridge	38th Street (Mandan)	River Road	Construct as 4-lane rural roadway from River Road (Bismarck) to 38th Street (Mandan), including construction of Missouri River Bridge.	$86,000,000
66	37th Street NW	56th Avenue	ND 1806	Construct 3-lane urban section.	$49,700,000
67	37th Street NW	ND 25	56th Avenue	Construct 2-lane urban section.	$24,924,000
68	ND 1806	Old Red Trail	37th Street	Intersection capacity improvement, add turn lanes at key intersections. (Assume minor intersection improvements to match new 37th St section)	$6,425,070
69	38th Street NW	Old Red Trail	Collins Avenue / ND 1806	Construct as 3-lane urban section.	$21,300,000
70a	8th Avenue NW	27th Street NW	37th Street NW	Construct 3-lane urban section.	$7,100,000
70b	8th Avenue NW	37th Street NW	38th Street	Construct 3-lane urban section.	$7,100,000

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
71a	Sunset Drive	Middle School	37th Street NW	Construct as 3-lane urban section.	$5,325,000
71b	Sunset Drive	37th Street NW	38th Street	Construct as 3-lane urban section.	$5,325,000
72a	37th Street NW	Sunset Drive	ND 1806	Construct urban 3-lane for arterial connection	$9,585,000
72b	37th Street NW	Old Red Trail	Sunset Drive	Construct urban 3-lane for arterial connection	$9,585,000
73	Division Street NE	Chippewa Avenue NE	Mandan Avenue	Construct as 2-lane urban section.	$6,324,000
74	Sunset Drive	Old Red Trail	31st Street NW	Reconstruct as 3-lane urban section	$6,532,000
75	Sunset Drive Corridor	27th Street N	Boundary Street	Intersection improvements along Sunset at 27th, Old Red Trail, and Boundary	$5,925,000
77	Old Red Trail	8th Avenue NW	ND1806 / Collins Avenue	Restripe for 3-lane urban section.	$93,615
78	Mandan Avenue	I-94		Interchange reconstruction.	$59,250,000
80	Division Street	Sunset Drive	ND 1806 / Collins Avenue	Reconstruct as 3-lane urban section	$6,816,000
81	Sunset Drive	Division Street	Boundary Street	Reconstruct as 3-lane urban section	$7,526,000
82	3rd Avenue NE	5th Street NE	Division Street NW	Narrow pavement	$5,925,000
83	I-94	I-194	Main Street / Exit 155	Recommendation pending Grant Marsh Bridge Feasibility Study	$0
84	Highway 1806	19th Street SW	Heart River Bridge	Pavement preservation project, including addition of turn lanes and signals at 8th Avenue and 19th Street.	$4,147,500
85	19th Street SE	ND 6	ND1806	Reconstruct as 3-lane urban section.	$25,560,000
86	McKenzie Drive	46th Avenue SE		Intersection capacity improvement	$5,925,000
87	McKenzie Drive	ND 1806	40th Ave S	Construct as 2-lane rural section.	$25,000,000
88	McKenzie Drive	ND 6	ND 1806	Construct as 2-lane rural section.	$16,632,000
89	56th Avenue	Old Red Trail	37th Street	Reconstruct as 3-lane urban section .	$14,200,000
90	Old Red Trail	47th Avenue NW	57th Avenue NW	Old Red Trail realignment to accommodate future interchange	$4,884,000

Project ID	Corridor Location	From	To	Description	Estimated Cost (2024$)
91	56th Avenue NW	I-94 Business Loop (Main Street)	Old Red Trail	Construct as 3-lane urban section.	$34,222,000
92	Boundary Road	56th Avenue / I-94 Interchange	32nd Avenue NW	Construct as 3-lane urban section.	$22,436,000
93	32nd Avenue W	I-94 Business Loop (Main Street)	Boundary Road (Future)	Construct as 2-lane urban section.	$26,536,000
94	Boundary Road	32nd Avenue	Sunset Drive	Construct as 3-lane urban section.	$23,430,000
95	31st Street NW	Lohstreter Road	Boundary Road (Future)	Construct as 2-lane urban section.	$12,276,000
96	Division Street	Sunset Drive	Lohstreter Road	Construct urban 3-lane to extend Division Street	$13,490,000
97	3rd Street SW	6th Avenue / ND1806	Memorial Highway	Restripe / overlay to include turn lanes or restripe to 3-lane section with center turn lane and no parking.	$500,000
99	56th Avenue NW	I-94		New interchange.	$34,250,000
100	32nd Avenue	I-94		Grade separation- overpass / underpass.	$20,550,000
101	3rd Street SW	6th Avenue SE	Highway 6	Restripe / overlay to include turn lanes or restripe to 3-lane section with center turn lane and no parking.	$500,000
102	Main Ave	26th St		Intersection capacity improvement / Roundabout	$3,000,000
103	43rd Ave N	52nd St		Intersection capacity improvement / Roundabout	$3,000,000
104	Burleigh Ave	12th St		Intersection capacity improvement / Roundabout	$3,000,000
105	27th St	Sunset Dr		Intersection capacity improvement / Roundabout	$2,250,000
106	71st Avenue NE	Centennial Road		Intersection capacity improvement / roundabout.	$5,000,000

Appendix E: Arrive 2050 Funding Plan

Arrive 2050 Funding Plan

This chapter provides a summary of the funding plan developed as part of the Arrive 2050 planning process. The funding plan details analyses related to the following:

- **Current funding programs**
- **Historic revenue levels by program**
- **Forecasted revenue levels that can reasonably be expected through the year 2050**

These analyses provide a baseline funding plan to support the development of Arrive 2050's Fiscally Constrained Plan.

Financial Plan in the MTP

Federal metropolitan transportation planning requirements articulated in 23 CFR 450.324 require that an MPO's MTP contain a financial plan that demonstrates how the MTP can be implemented based on an understanding of the reasonable transportation funding levels expected through the life of the plan.[1] These regulations also require a demonstration of fiscal constraint and the ability of the MPO to adequately operate and maintain the federal-aid transportation system. This section of the report will discuss the current funding programs providing transportation revenues to the Bismarck-Mandan MPO and sources of local revenues used for transportation purposes.

Relevant Funding Programs

The following funding programs comprise the key sources of transportation revenues for the Bismarck-Mandan MPO's partner agencies. The funding sources direct federal transportation dollars (not including local matching funds), with NDDOT leading the program administration.

NDDOT allocates federal transportation funds to the state's MPOs for use on federally eligible transportation projects.

Interstate Program

The Interstate Program directs NDDOT funding toward improvements and modifications to existing or new interchanges needed to alleviate congestion due to mainline traffic.[2] While NDDOT is responsible for funding interstate improvements, local public agencies (LPAs) are required to fund grade-separated non-interchange roads and interchange projects stemming from cross-road traffic.[3]

Under the Interstate Program, NDDOT provides the match for federal funds, which is 10 percent for improvements that do not add capacity and 19.07 percent for improvements that add capacity.

National Highway Performance Program

The National Highway Performance Program (NHPP) replaced the former Interstate Maintenance program administered by NDDOT. NHPP provides funding for projects that support the condition and performance of the state's NHS, including new NHS facilities that further the state's progress toward performance measure targets. NDDOT directs NHPP funding allocated to the MPO region, who does not annually solicit these funds. NDDOT continues to program projects under an Interstate or IM category. It is noted that this is a project category and does not constitute a separate funding program.

[1] 23 CFR Part 450.
[2] North Dakota Department of Transportation, *Local Government Manual*
[3] Ibid.

Urban and Regional Programs

Urban Roads Program

Urban roads refers to roadways owned by LPAs that are located on the federal aid system. Funding provided to the MPO under the Urban Roads program is allocated through collaboration between the MPO and NDDOT based on annual funding available to the state's LPAs. LPAs are responsible for the prioritization of improvements within their jurisdictions; NDDOT does not solicit funding for improvements that qualify under the program.[4]

Urban Roads funds are distributed to LPAs on each LPA's proportion of population compared to the state's total urban population per the most recent decennial census. Eligible project types that can receive federal funds under the Urban Roads program include preliminary engineering (PE), construction engineering (CE), right-of-way acquisition, utility relocation, and construction. Each LPA is responsible for providing the local match for federal funds, which is 19.07 percent of total project cost.

Urban Regional Roads Program

Urban regional roads are defined as state highways that run through cities with populations of 5,000 or more. NDDOT coordinates annually with eligible LPAs to program projects based on available Urban Regional Roads funding. NDDOT annually solicits for projects that qualify under this program and distributes funds based on needs.

Activities eligible for Urban Regional Roads funds include PE, CE, right-of-way acquisition, utility relocations, and construction. The Urban Regional Road Program consists of two sub-programs that determine local match requirements:[5]

- **Primary Regional Program:** The match for federal funds is provided by NDDOT (19.07 percent), except for service road improvements and items not eligible for federal aid. In these instances, the LPA is responsible for providing a local match.
- **Secondary Regional Program:** The match for federal funds is provided by NDDOT (9.07 percent) and the LPA (10 percent), except for service road improvements and items not eligible for federal aid. In these instances, the LPA is responsible for providing the local match.

Safety Program

NDDOT's Safety Program allocates funding from the federal Highway Safety Improvement Program (HSIP) that are to be used on safety projects. NDDOT allocates these funds to projects that reduce fatal and serious injury crashes. Projects funded under the Safety Program are selected based on NDDOT's annual list of high-crash locations and local safety needs submitted by LPAs. Based on the LPA's safety needs, eligibility criteria, and available HSIP funds, NDDOT develops its safety program for the next 4 years; projects located in MPO boundaries require LPAs to go through the MPO prioritization process.[6]

Eligible activities under the Safety Program include PE, CE, right-of-way acquisition, utility relocations, and construction for projects located on the state highway system; CE and construction are the only activities eligible for safety funds for projects located on the LPA roads system. Federal funds provide 90 percent of funding for safety projects, and the 10 percent match is provided by either NDDOT or NDDOT and the LPA, depending on the project location.

[4] North Dakota Department of Transportation, *State Funding Programs*
[5] North Dakota Department of Transportation, *Local Government Manual*
[6] Ibid.

Transportation Alternatives Program

The Transportation Alternatives (TA) Program provides funding for programs and projects defined as transportation alternatives, including bicycle and pedestrian facilities, Safe Routes to School projects, safe routes for non-drivers, community improvement activities, and environmental mitigation projects.[7] TA funds are distributed on a discretionary basis, with projects selected by NDDOT's TA project selection committee.

Construction is the only activity eligible for funding under the TA Program. PE, CE, environmental impact mitigation, right-of-way acquisition, and utility relocations are not eligible for TA funding and are the responsibility of the LPA. Federal funds allocated under the TA Program cover 80.93 percent of total project costs, and the LPA is responsible for a 19.07 percent local match.

Additional Federal and State Sources of Transportation Funds

The programs described above provide the majority of annual transportation funds for the MPO region. However, NDDOT administers several additional programs that aid the MPO in funding regional transportation improvements. These programs include:

- **Flexible Transportation Fund Program (Flex Fund):** Established by the 68th Legislative Assembly in 2023, the Flex Fund Program provides LPAs with funding for projects that meet or advance economic development, safety, complete streets, multimodal system, roadway restriction (height or weight limitations), and innovation goals. Funds are allocated on a discretionary basis and awarded through the state's Flex Fund committee.
- **Urban Grant Program (UGP):** This program distributes approximately $4.6 million each year to North Dakota cities with populations of 5,000 or more. These funds are used for improvements on federal aid roadways in urbanized areas and are intended to improve bicycle, pedestrian, or other multimodal facilities that enhance downtown areas.
- **Recreational Trails Program (RTP):** This program is a discretionary grant program that provides funding for motorized and non-motorized recreational trail projects. It is administered at the state level by the North Dakota Parks and Recreation Department and federally through the FHWA. Grant awards range from a minimum of $30,000 to a maximum of $250,000 and require a 20 percent local match.[8]

Emerging Federal Funding Programs

The Bipartisan Infrastructure Law, signed into legislation as the Infrastructure Investment and Jobs Act, introduced new formula and discretionary transportation grant programs that address the areas of safety, modernization, climate, and equity. In the MPO region, several formula funding programs authorized through IIJA are anticipated to bring additional transportation revenues to the region. These programs include:

- **Carbon Reduction Program (CRP):** This program provides funding for projects that reduce carbon dioxide emissions from on-road highway sources.
- **Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT):** This program provides funding to increase the resiliency of surface transportation to natural hazards.

Local Funding Programs

The LPAs in the MPO region have local funding programs that are used to supplement the MPO funding programs discussed above and provide funding for transportation improvements that do not receive federal funding assistance. Major local funding programs for

[7] North Dakota Department of Transportation, *Transportation Alternatives*

[8] North Dakota Parks and Recreation, *Recreational Trails Program*

the Bismarck and Mandan, as well as Burleigh and Morton Counties, are discussed below.

City of Bismarck

Local funding programs that Bismarck uses for transportation improvements include the following:[9]

- **Special Assessments Fund:** Funds received from the city's special assessments
- **Sales Tax Fund:** Special revenues collected from the city's self-imposed 1.5 percent sales tax revenue for voter-approved eligible expenditures
- **Special Deficiency Fund:** Funds made up of transfers from the city's general fund to supplement special assessment revenues and bridge gaps in funding for capital projects
- **Street Light Utility Fund:** Accounts for the cost of providing electricity and maintenance of the city's residential street lights and traffic signals

City of Mandan

Local funding programs that Mandan uses for transportation improvements include the following:[10]

- **Highway Distribution Fund:** Money distributed by the state treasurer and allocated to incorporated cities
- **Special Assessments Fund:** Funds received from special assessments, which include sidewalks, curbs, gutters, and streets
- **1 Percent City Sales Tax Fund:** Accounts for the 1 percent city sales and use tax for reducing property taxes and municipal debt; street, water, and sewer system improvements; and jobs and economic development
- **Street Light Utility Fund:** Accounts for the activities of the city's street lighting system operations

Burleigh County

Local funding programs that Burleigh County uses for transportation improvements include the following:[11]

- **County Road and Bridge Fund:** Revenues made available from NDDOT to assist North Dakota counties in implementing projects on federal aid routes that are owned by the respective county. Funding for bridges more than equal to or greater than 20 feet in span is also available to North Dakota counties for replacement or rehabilitation projects.
- **Highway Tax Distribution:** Money distributed by the state treasurer and allocated to North Dakota's counties.

Morton County

Local funding programs that Morton County uses for transportation improvements include the following:[12]

- **County Road and Bridge Fund:** Revenues made available from NDDOT to assist North Dakota counties in implementing projects on federal aid routes that are owned by the respective county. Funding for bridges more than equal to or greater than 20 feet in span is also available to North Dakota counties for replacement or rehabilitation projects.
- **Unorganized Road Fund:** Funding for roadway improvements on roads in unorganized townships.
- **Highway Distribution Tax Fund:** Money distributed by the state treasurer and allocated to North Dakota's counties.

[9] City of Bismarck, *Annual Budget Fiscal Year 2024*
[10] City of Mandan, *Budget Policies*
[11] Burleigh County, *Budget of Burleigh County, North Dakota, 2024*
[12] Morton County, *Morton County 2023 Budget Revenue YTD*

Historic Revenue Levels

MPO Programs

Historic revenues levels received by the MPO for the years 2017–2024 were analyzed based on historic TIP documents for this period. Based on the analysis of these documents, baseline revenue levels for the MPO's key funding programs were identified and then used to forecast reasonably expected revenues through the year 2050. These forecasted revenues comprise Arrive 2050's fiscally constrained plan.

Table 1 summarizes the historic revenues for the Urban Roads, Urban Regional Roads, Interstate, NHPP, Safety, Urban Grant, and TA Programs on an annual basis and provides total and average revenue levels received between 2017 and 2024.

Historic Urban Roads Revenues

Urban Roads revenues received by the MPO between 2017 and 2024 were reviewed based on the agency's funding amounts granted through the Obligation Authority, which totaled a little more than $33 million and averaged nearly $4.2 million per year during this period.

Historic Urban Regional Roads Revenues

Urban Regional Roads revenues received by the MPO between 2017 and 2024 totaled roughly $158 million and averaged $19.8 million per year during this period. Similar to the Urban Roads Program, Urban Regional Roads revenues saw substantial fluctuations on a year-to-year basis owing to high dollar projects programmed the years 2023 and 2024, which resulted in a high historic total and average annual revenue level.

Historic Interstate Revenues

Interstate revenues received by the MPO between 2017 and 2024 total $94.3 million and averaged $11.8 million per year. Several years saw higher revenue levels due to the programming of higher-cost projects in 2019, 2023, and 2024.

Historic NHPP Revenues

NHPP revenues received by the MPO between 2017 and 2024 totaled $66.7 million and averaged $8.3 million per year during this period. While historic NHPP revenues saw fluctuation on an annual basis, the fluctuations were not as significant as other MPO funding programs.

Historic Safety Revenues

Safety revenues received by the MPO between 2017 and 2024 totaled nearly $20.8 million and averaged $2.6 million per year.

Historic TA Revenues

TA revenues received by the MPO between 2017 and 2024 totaled $3.5 million and averaged a little less than $432,000 per year. The trend in historic TA revenues received on an annual basis was stable, with only the year 2022 seeing a higher-than-normal receipt of TA funds.

Historic Urban Grant Revenues

Urban Grant revenues received by the MPO between 2017 and 2024 totaled $6.7 million and averaged roughly $842,000 per year during this time. Given the discretionary nature of this funding source, the MPO does not anticipate receiving Urban Grant funding each year.

Table 1: Historic MPO Funding Revenues

Program	2017	2018	2019	2020	2021	2022	2023	2024	Total	Average
Urban Roads	$3,692,312	$3,756,158	$3,926,416	$4,370,382	$4,470,216	$4,248,520	$4,404,943	$4,499,223	$33,368,170	$4,171,021
Urban Regional Roads	$451,000	$0	$5,117,378	$12,302,000	$13,696,808	$14,386,859	$72,939,612	$39,140,876	$158,034,533	$19,754,317
Interstate	$8,708,196	$7,410,545	$15,602,600	$0	$9,959,851	$3,000,000	$19,416,231	$30,248,768	$94,346,191	$11,793,274
NHPP	$201,000	$0	$5,117,378	$9,652,000	$23,068,789	$10,294,966	$15,639,069	$2,741,006	$66,714,207	$8,339,276
Safety	$580,000	$0	$3,782,000	$0	$6,599,820	$7,063,473	$2,593,104	$140,000	$20,758,397	$2,594,800
TA	$206,000	$0	$412,110	$0	$639,000	$1,210,879	$473,000	$514,499	$3,455,488	$431,936
Urban Grant	$0	$0	$1,976,099	$0	$0	$2,851,000	$1,912,000	$0	$6,739,099	$842,387

Source: Bismarck-Mandan MPO, *2017–2024 Transportation Improvement Programs*

Local Programs

Historic revenues received by the LPA's in the MPO region, including the cities of Bismarck and Mandan and Burleigh and Morton Counties, were analyzed based on historic agency budgets and capital improvement programs. Based on the historic revenue levels identified in these documents, baseline revenue levels for the LPA's key funding programs were identified and then used to forecast reasonably expected revenues through the year 2050. These forecasted revenues comprise fiscally constrained revenue levels for the LPAs.

City of Bismarck

Revenues received by Bismarck were identified based on capital improvement program information for transportation improvements between 2017 and 2024 for the city's Special Assessments, Sales Tax, Special Deficiency, and Street Light Utility funds. A summary of historic revenues received for each fund is shown in **Table 2**.

As **Table 2** shows, revenues received by Bismarck for the Special Assessments fund totaled more than $121 million between 2017 and 2024, averaging $15.1 million per year. Revenues received for the Sales Tax fund total $109.6 million during this period and averaged $13.7 million per year, while revenues received for the Special Deficiency fund total $18.1 million, at an average of $2.2 million per year between 2017 and 2024. Street Light Utility fund revenues amounted to $6.4 million and averaged a little less than $1.1 million per year.

City of Mandan

Revenues received by Mandan were identified based on the city's annual budget documents for the years 2022–2024. Sources of transportation-related revenues for Mandan include the Highway Distribution fund, Special Assessments fund, 1 Percent City Sales Tax fund, and the Street Light Utility fund. **Table 3** shows historic revenues received for these funds between 2022 and 2024.

As **Table 3** shows, Mandan received a little less than $3.4 million in Highway Distribution funds between 2022 and 2024, averaging $1.1 million per year. Revenues received for the Special Assessments fund totaled $12.1 million at an average of $4 million per year, while 1 Percent City Sales Tax revenues equaled roughly $9.6 million and averaged $3.2 million per year. Street Light Utility fund revenues received between 2022 and 2024 totaled $1.4 million at an average of $470,000 per year.

Burleigh County

Revenues received by Burleigh County were identified based on the county's historic budgets for the years 2018 and 2024, which identify revenue levels for the county's County Road and Bridge fund and Highway Tax Distribution fund. A summary of historic revenues received for each fund is shown in **Table 4**.

As **Table 4** shows, revenues for the County Road and Bridge fund totaled $91.1 million between 2018 and 2024, with annual revenues averaging a little more than $13 million. Highway Tax Distribution fund revenues totaled $48.7 million at an average of a little less than $7 million per year.

Morton County

Revenues received by Morton County were identified based on historic county budget documents for the years 2015–2023, which provide historic annual revenues for the county's County Road and Bridge fund, Unorganized Road fund, and Highway Distribution Tax fund. **Table 5** summarizes historic revenues by program for Morton County.

As **Table 5** shows, Morton County received $21.3 million in County Road and Bridge funds between 2015 and 2023, with revenues for this program averaging $2.4 million annually.

Unorganized Road fund revenues amounted to $8.5 million, with an average of $944,000 per year, while Highway Distribution Tax fund revenues equaled $48.2 million, or $5.4 million per year.

Table 2: City of Bismarck

Program	2017	2018	2019	2020	2021	2022	2023	2024	Total	Average
Special Assessments Fund	$11,797,921	$9,104,475	$10,715,550	$13,797,536	$23,763,773	$20,885,274	$16,531,628	$14,533,000	$121,129,158	$15,141,000
Sales Tax Fund	$0	$0	$5,199,989	$17,101,356	$6,341,044	$46,196,396	$9,976,606	$24,808,000	$109,623,390	$13,703,000
Special Deficiency Fund	$8,435,772	$4,888,611	$90,213	$888,363	$839,059	$0	$274,041	$2,680,000	$18,096,059	$2,262,000
Street Light Utility Fund	$0	$0	$565,345	$676,665	$728,111	$977,956	$1,291,216	$2,116,045	$6,355,338	$1,059,000

Source: City of Bismarck Capital Improvement Program Summaries

Table 3: City of Mandan

Program	2022	2023	2024	Total	Average
Highway Distribution Fund	$1,094,864	$1,094,864	$1,178,110	$3,367,838	$1,123,000
Special Assessments Fund	$4,261,135	$4,261,135	$3,586,239	$12,108,509	$4,036,000
1 Percent City Sales Tax Fund	$3,172,347	$3,172,347	$3,232,482	$9,577,176	$3,192,000
Street Light Utility Fund	$472,502	$466,090	$472,589	$1,411,181	$470,000

Source: City of Mandan

Table 4: Burleigh County

Program	2018	2019	2020	2021	2022	2023	2024	Total	Average
County Road and Bridge Fund	$15,482,793	$16,821,945	$10,733,765	$9,498,849	$9,645,164	$14,771,527	$14,189,672	$91,143,715	$13,021,000
Highway Distribution Tax Fund	$6,502,000	$7,215,000	$7,211,000	$6,033,164	$6,621,622	$8,200,000	$6,950,000	$48,732,786	$6,962,000

Source: Burleigh County

Table 5: Morton County

Program	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total	Average
County Road and Bridge Fund	$6,437,37	$7,721,543	$1,061,467	$1,180,120	$746,557	$1,070,958	$1,046,980	$1,006,461	$1,039,817	$21,311,275	$2,368,000
Unorganized Road Fund	$1,039,39	$786,590	$787,368	$845,433	$909,682	$947,699	$1,401,686	$884,861	$888,815	$8,491,530	$944,000
Highway Distribution Tax Fund	$2,960,00	$2,488,185	$26,190,00	$2,769,582	$2,779,234	$2,523,613	$2,596,289	$2,628,000	$3,271,837	$48,206,740	$5,356,000

Source: Morton County

Future Forecasted Revenue Levels

Federal metropolitan transportation planning regulations require the MTP to include an estimate of future revenues that the MPO may reasonably expect to receive over the life of the plan. Based on the historic revenue levels and input from MPO staff, future revenue levels were forecasted to reasonably estimate the level of transportation revenues the MPO may receive through 2050.

Baseline Revenue Levels for MPO Programs

Baseline revenue levels represent the basis for forecasting future revenue levels for the key MPO programs detailed in **Table 6**. Baseline revenue levels were developed based on the average annual revenue received for each program between 2017 and 2024, with several adjustments made for certain programs.

Table 6 summarizes the baseline revenue levels for each MPO program.

Baseline Urban Roads Revenues

The baseline level used for forecasting future Urban Roads revenues was identified through the Obligation Authority allotment from NDDOT for the MPO region. The current allotment spans the years 2023–2028, and the allotments for the years 2025–2028 were used as the Urban Roads revenue level forecast for this time frame; using this approach, the Urban Roads baseline revenue level is $5,339,971 as shown in **Table 6**. Urban Roads revenues for the year 2029 and beyond were then forecasted by applying the revenue growth rate discussed in the following section to the Obligation Authority allotment for the year 2028.

Baseline Urban Regional Roads Revenues

The baseline level used for forecasting future Urban Regional Roads revenues was identified by adjusting the annual average revenue level calculated for this program based on the historic 2017–2024 TIP documents, which was $19,754,317 due to certain TIP years in which the MPO programmed high dollar projects that received Urban Regional Roads funds. To adjust this high annual average revenue level, the TIP years in which the high dollar projects were programmed were reviewed to remove these projects from the historic trend so that a reasonable baseline revenue level could be identified. Using this approach, the resulting Urban Regional Roads baseline revenue level used to forecast future Urban Regional Roads revenues was $4,760,000, as shown in **Table 6**.

Table 6: Estimated Baseline Annual Revenue Levels by MPO Program

Program	Baseline Revenue Level
Urban Roads	$5,339,971
Urban Regional Roads	$4,760,000
Interstate	$6,210,000
NHPP	$4,890,000
Safety (State)	$1,540,000
Safety (Urban)	$1,430,000
TA	$361,452
Urban Grant	$580,000
Carbon Reduction Program	$840,000
PROTECT	$1,470,000

Note: See page 12 for a description of the approach used for forecasting future funding levels.

Baseline Interstate Revenues

The baseline level used for forecasting future Interstate revenues, which are sourced from NDDOT's NHPP allocation, was identified using the same approach utilized for the baseline Urban Regional Roads revenues, in which the historic annual average revenue level was adjusted due to the programming of high dollar projects receiving Interstate funds between 2017 and 2024. While the historic average annual revenue based on the historic TIP documents was $11,793,274, a revised historic analysis that removed the high dollar projects programmed with Interstate funds resulted in a baseline revenue level of $6,210,000, as shown in **Table 6**. It should be noted that Interstate funding is allocated statewide based on interstate needs. Historic revenues are not necessarily indicative of future funding levels.

Baseline NHPP Revenues

The baseline revenue level used for forecasting future non-interstate NHPP revenues was identified by adjusting the historic average annual revenue level of $8,339,276 that was identified during the review of historic TIP documents. As with the Urban Regional Roads and Interstate Programs, several historic TIP years included high dollar projects funded through NHPP funds. Removing these high dollar projects from the historic revenue level analysis yielded a historic average annual revenue level of $4,890,000, which was used as the baseline revenue level for forecasting future NHPP revenues, as shown in **Table 6**. It should be noted that NHPP funding is allocated statewide based on NHS needs. Historic revenues are not necessarily indicative of future funding levels.

Baseline Safety Revenues

The baseline revenue level used for forecasting future safety revenues was identified by carrying forward the historic average annual revenue level shown in **Table 6**. It is noted that forecasted Safety funds were split into state and urban funds, which carries forward the approach used for the development of Arrive 2045. To split the funds between state and urban revenues, the same ratio used in Arrive 2045 was carried forward: 52 percent revenues being allocated to state Safety revenues and 48 percent to urban Safety revenues. The resulting baseline Safety revenues are $1,540,00 for state funds and $1,430,000 for urban funds, as shown in **Table 6**.

Baseline Transportation Alternatives Revenues

The baseline revenue level used for forecasting future TA revenues was identified based on the Obligation Authority allotment for the year 2028, which is $391,874. This allotment was then deflated to the base year 2025 using the revenue growth rate discussed in the following section. The resulting baseline revenue level used for forecasting TA funds was $361,452, as shown in **Table 6**.

Baseline Urban Grant Revenues

The baseline revenue level used for forecasting future Urban Grant revenues was identified by adjusting the historic annual average amount shown in **Table 6** to account for the percentage of the MPO's population in proportion to the total population of North Dakota living in the state's urban areas. The resulting baseline revenue level was $580,000, as shown in **Table 6**. The Urban Grant forecasts also assume that the MPO receives Urban Grant funding every 4 years, beginning in 2025.

Baseline Carbon Reduction Program Revenues

The baseline revenue level used for forecasting future Carbon Reduction Program (CRP) revenues was identified by annualizing the amount of CRP funds authorized by the federal government for the state of North Dakota's urban areas and calculating the percentage of the annual statewide CRP funding allocation that would go to the MPO area compared to the total population of North Dakota living in the state's urban areas. This approach was used due to the MPO not having a historic CRP revenue trend to analyze for the years

2017–2024. The resulting baseline revenue level used for forecasting CRP funds was $840,000, as shown in **Table 6**.

Baseline PROTECT Revenues

The baseline revenue level used for forecasting future PROTECT revenues was identified using the same approach that was used to develop the baseline CRP revenue level; the estimated 5-year total of federal PROTECT apportionment for North Dakota was annualized, and then a baseline revenue level for the MPO region was calculated based on the percentage of the MPO's population compared to the state's overall population living in urban areas. The resulting baseline revenue level was $1,470,000, as shown in **Table 6**.

Baseline Revenue Levels for Local Programs

Baseline revenue levels used to forecast local funds were developed based on the historic revenue levels discussed in the preceding section. The historic revenue level for each LPA funding program was averaged, and the average amount constituted the baseline revenue level used to forecast funding through 2050. **Table 7** presents the baseline revenue level for each LPA's funding program.

City of Bismarck

The baseline level used for forecasting future Special Assessments fund revenues for Bismarck used the average annual revenue level this program received between 2017 and 2024, which was $15,141,000 as shown in **Table 7**. The baseline level used to forecast Sales Tax fund revenues used the same approach and resulted in a baseline revenue level of $13,703,000, while the Special Deficiency fund baseline revenue level was identified as $2,262,000. The Street Light Utility fund baseline revenue level used for forecasting this fund's revenues through 2050 was $1,059,000.

City of Mandan

The baseline revenue level used for forecasting Highway Distribution funds for Mandan carried forward the annual average historic funding level shown in **Table 3**, which was $1,123,000 as shown in **Table 40** below. The Special Assessments fund baseline revenue level used to forecast revenues for this fund through 2050 was $4,036,000, while the 1 Percent City Sales Tax fund baseline revenue was identified as $3,192,000. A baseline revenue level of $470,000 was identified for the city's Street Light Utility fund.

Table 7: Baseline Annual Revenues for the Cities of Bismarck and Mandan

Program	Baseline Revenue Level
City of Bismarck	
Special Assessments Fund	$15,141,000
Sales Tax Fund	$13,703,000
Special Deficiency Fund	$2,262,000
Street Light Utility Fund	$1,059,000
City of Mandan	
Highway Distribution Fund	$1,123,000
Special Assessments Fund	$4,036,000
1 Percent City Sales Tax Fund	$3,192,000
Street Light Utility Fund	$470,000

Burleigh County

The baseline level used for forecasting future County Road and Bridge fund revenues for Burleigh County was $13,021,000, as shown in **Table 8**. The baseline level used to forecast Highway Distribution Tax fund revenues was $6,962,000.

Morton County

The baseline level used for forecasting future County Road and Bridge fund revenues for Morton County was $2,415,000, as shown in **Table 8**. The baseline level used to forecast Unorganized Road fund revenues was $963,000, while the baseline revenue level for Morton County's Highway Distribution Tax fund revenues was $5,463,000.

Table 8: Baseline Annual Revenues for Burleigh and Morton Counties

Program	Baseline Revenue Level
Burleigh County	
County Road and Bridge Fund	$13,021,000
Highway Distribution Tax	$6,962,000
Morton County	
County Road and Bridge Fund	$2,415,000
Unorganized Road Fund	$963,000
Highway Distribution Tax Fund	$5,463,000

Revenue Forecast Growth Rates

The next step in forecasting future revenues for the MPO's key funding programs was to identify annual growth rates to apply to the baseline revenue levels shown in **Table 8**. Guidance from NDDOT staff for forecasting future Urban Roads and TA funds was to use an annual growth rate between 2 and 4 percent; to ensure a reasonable expectation for future revenues, a more conservative annual growth rate of 2 percent was selected for forecasting future revenues. This annual growth rate was then applied to all the MPO's funding programs except the CRP and PROTECT programs, which were grown at a rate of 1.5 percent per year.

Forecasted future revenues for LPA funding programs also applied a 2 percent per year growth rate.

Forecast Time Bands

Future forecasted revenues were organized into time bands so that the future funds could reflect year of expenditure (YOE) values that inform the development of Arrive 2050's fiscally constrained plan. The time bands identified were:

- **Current TIP:** 2025–2028
- **Short Term:** 2029–2033
- **Mid-Term:** 2034–2042
- **Long Term:** 2043–2050

Future Revenue Forecasts for MPO Programs

The resulting future revenue forecasts for the MPO's key funding programs are summarized by time band in **Table 9**.

Forecasted Urban Roads Revenues

Applying the 2 percent annual growth rate to the baseline revenue level shown in **Table 9** resulted in a total forecasted revenue level of $155.7 million in Urban Roads funding for the years 2029–2050. Forecasted short-term Urban Roads revenues amount to $29.7 million, while forecasted mid-term revenues are $61.4 million. Forecasted long-term Urban Roads revenues amount to $64.6 million.

Forecasted Urban Regional Roads Revenues

The total forecasted revenue level for the Urban Regional Roads Program amounts to $143.5 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term Urban Regional Roads

revenues equal $27.3 million, while forecasted mid-term revenues are $56.6 million. Forecasted long-term Urban Regional Roads revenues amount to $59.5 million.

Forecasted Interstate Revenues

The total forecasted revenue level for the Interstate Program amounts to approximately $187.2 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term Interstate revenues equal nearly $35.7 million, while forecasted mid-term revenues are $73.8 million. Forecasted long-term Interstate revenues amount to $77.7 million.

Forecasted NHPP Revenues

The total forecasted revenue level for the NHPP Program amounts to approximately $147.4 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term NHPP revenues equal $28.1 million, while forecasted mid-term revenues are a little more than $58 million. Forecasted long-term NHPP revenues amount to $61.1 million.

Forecasted Safety Revenues

The total forecasted revenue level for the state Safety program amounts to approximately $46.4 million, while total forecasted urban Safety program revenue levels are $43.1 million, as shown in **Table 9**. Forecasted short-term state Safety revenues equal $8.8 million, and urban Safety revenues amount to $8.2 million. Mid-term state Safety revenues equal a little more than $18 million, and mid-term urban safety revenues equal $17 million. State Safety revenues for the long term were forecasted to equal approximately $19.3 million, while urban Safety revenues for the long term equal $17.9 million.

Forecasted TA Revenues

The total forecasted revenue level for the TA Program amounts to approximately $10.9 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term TA revenues equal $2 million, while forecasted mid-term revenues are $4.3 million. Forecasted long-term TA revenues amount to $4.5 million.

Forecasted Urban Grant Revenues

The total forecasted revenue level for the Urban Grant Program amounts to approximately $3.5 million for the years 2029–2050, as shown in **Table 9**. Given the assumption that the MPO will receive Urban Grant funds every 4 years, the resulting forecasts saw that the MPO would receive roughly $1.2 million in the short-, mid-, and long-term periods.

Forecasted Carbon Reduction Program Revenues

The total forecasted revenue level for the CRP amounts to $23.4 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term CRP revenues total approximately $4.7 million, while mid-term CRP revenues were forecasted to equal $9.3 million. Long-term CRP revenue forecasts amount to $9.4 million.

Forecasted PROTECT Revenues

The total forecasted revenue level for the PROTECT Program amounts to $40.9 million for the years 2029–2050, as shown in **Table 9**. Forecasted short-term PROTECT revenues total approximately $8.2 million, while mid-term PROTECT revenues were forecasted to equal $16.3 million. Long-term CRP revenue forecasts amount to $16.4 million.

Table 9: Forecasted Revenues by Time Band

Program	Short Term (2029–2033)	Mid-Term (2034–2042)	Long Term (2043–2050)	Total
Urban Roads	$29,683,000	$61,423,000	$64,605,000	$155,711,000
Urban Regional Roads	$27,346,000	$56,596,000	$59,511,000	$143,453,000
Interstate	$35,680,000	$73,842,000	$77,653,000	$187,175,000
NHPP	$28,096,379	$58,146,196	$61,143,412	$147,385,987
Safety (State)	$8,847,000	$18,311,000	$19,260,000	$46,418,000
Safety (Urban)	$8,219,000	$17,016,000	$17,897,000	$43,132,000
TA	$2,080,000	$4,303,000	$4,527,000	$10,910,000
Urban Grant	$1,160,000	$1,160,000	$1,160,000	$3,480,000
CRP	$4,665,000	$9,325,000	$9,402,000	$23,392,000
PROTECT	$8,156,000	$16,302,000	$16,446,000	$40,904,000
Total	**$153,932,379**	**$316,424,196**	**$331,604,412**	**$801,960,987**

Future Revenue Forecasts for Local Programs

The resulting future revenue forecasts for local jurisdictions' key funding programs are summarized by time band in **Table 10** through **Table 13**.

City of Bismarck

Forecasted future revenues for Bismarck's local funding programs are summarized in **Table 10**. As **Table 10** shows, forecasted revenues for the city's Special Assessments fund total $21,515,900 for the period 2029–2050; for the purpose of forecasting revenues for this program, an adjustment was made that took the retained 6 percent of total forecasted amounts of Special Assessments revenues for the Arrive 2050 horizon. This 6 percent factor was applied to discount total Special Assessments funds, and the factor was identified through an analysis of historic city budget documents that saw an average of 6 percent of total Special Assessments funding being transferred to Bismarck's Street Improvement Construction fund. The resulting short-term revenue levels from the application of this factor total $4.4 million, while mid-term revenues were forecasted at $11.2 million. Long-term Special Assessments revenues amount to $13.4 million.

A similar approach was used in forecasting future Sales Tax fund revenues, which applied a discount rate of 3.8 percent based on historic allocations of Sales Tax funds to improving the city's roads and streets. Overall, future forecasted revenues amount to $15.3 million, with $2.3 million in short-term revenues, $5.9 million in mid-term funds, and $7 million in long-term funds.

Future forecasted Special Deficiency fund revenues equal $66.8 million, with $10.1 million in short-term revenues, $25.6 million in mid-term revenues, and $30.9 million in long-term revenues. Street Light Utility fund revenue forecasts equal $31.3 million with $4.7 million in short-term revenues, $12.1 million in mid-term revenues, and $14.5 million in long-term revenues.

City of Mandan

Future forecasted revenues for Mandan's transportation-related programs total roughly $109.9 million through 2050, with a total of $20.9 million in short-term revenues, $43.3 million in mid-term revenues, and $45.6 million in long-term revenues. Forecasted revenues for the Highway Distribution fund equal $6.3 million in the short term, while mid-term revenues amount to $13.1 million. Long-term revenues were forecasted at $13.8 million. **Table 11** summarizes Mandan's future forecasted revenues.

Special Assessments fund revenues were adjusted using a similar approach to Bismarck's Special Assessments fund revenues in which a discount rate of 25 percent was applied to future revenues to reflect the historic allocation of these funds for transportation improvements. The resulting future revenue forecasts total $29.8 million, with $5.7 million in short-term revenues, $11.8 million in mid-term revenues, and $12.4 million in long-term revenues.

Mandan's future revenue forecasts for the 1 Percent City Sales Tax fund were also adjusted based on historic transfers of these funds to the city's General fund and for transportation improvements, which found that approximately 65 percent of 1 Percent City Sales Tax revenues were transferred to the General fund while roughly 35 percent were used for transportation-related improvements. The resulting future forecasts equal $33 million between 2029 and 2050. Short-term 1 Percent City Sales Tax revenues amount to $6.3 million, while mid-term revenues equaled $13 million; long-term revenues were forecasted at $13.7 million.

Future forecasted revenues for Mandan's Street Light Utility fund amount to $13.9 million with $2.6 million in short-term revenues, $5.5 million in mid-term revenues, and $5.8 million in long-term revenues.

Burleigh County

Total future forecasted revenues for Burleigh County equaled $590.5 million. Total short-term forecasted revenues amount to $89.2 million, while mid-term revenues were forecasted at $228.4 million. Long-term revenues amount to $272.9 million. **Table 12** summarizes forecasted future revenues for Burleigh County's funding programs.

Forecasted future revenues for the County Road and Bridge fund equal $384.7 million for the years 2029–2050. Short-term County and Road Bridge fund revenue forecasts equal $58.1 million, mid-term forecasted revenues equal $148.8 million, and long-term revenues amount to $177.8 million.

Total forecasted future revenues for Burleigh County's Highway Distribution Tax fund forecasts equal $205.7 million; short-term revenues were forecasted to $31.1 million, while mid-term revenues are anticipated to equal $79.6 million. Long-term revenues amount to just over $95 million.

Morton County

Total future forecasted revenues for Morton County equaled $261.2 million. Total short-term forecasted revenues amount to a little less than $50 million, while mid-term revenues were forecasted to $103 million. Long-term revenues amount to $108.3 million. **Table 13** summarizes forecasted future revenues for Morton County's funding programs.

Forecasted future revenues for the County Road and Bridge fund equal $71.3 million for the years 2029–2050. Short-term County Road and Bridge fund revenue forecasts equal $13.6 million, mid-term forecasted revenues equal $28.1 million, and long-term revenues amount to $29.6 million.

Forecasted future revenues for the Unorganized Road fund total $28.4 million for the years 2029–2050. Short-term Unorganized Road fund revenues equal $5.4 million, while mid-term revenues amount to $11.2 million. Long-term Unorganized Road fund revenues were forecasted to a little less than $11.8 million.

The Highway Distribution Tax fund is anticipated to provide the largest proportion of future revenues for Morton County. Overall revenue forecasts equal $161.4 million; short-term revenues were forecasted at $30.8 million, while mid-term revenues are anticipated to equal $63.7 million. Long-term revenues amount to a little less than $67 million.

Table 10: City of Bismarck

Program	Short Term (2029–2033)	Mid-Term (2034–2042)	Long Term (2043–2050)	Total
Special Assessments Fund	$4,385,000	$11,234,000	$13,426,000	$29,045,000
Sales Tax Fund	$2,315,000	$5,930,000	$7,087,000	$15,332,000
Special Deficiency Fund	$10,091,300	$25,851,500	$30,894,300	$66,837,100
Street Light Utility Fund	$4,724,600	$12,103,100	$14,465,200	$31,292,900
Total	**$21,515,900**	**$55,118,600**	**$65,872,500**	**$142,507,000**

Table 11: City of Mandan

Program	Short Term (2029–2033)	Mid-Term (2034–2042)	Long Term (2043–2050)	Total
Highway Distribution Fund	$6,322,000	$13,079,000	$13,750,000	$33,151,000
Special Assessments Fund	$5,683,750	$11,760,750	$12,366,000	$29,810,500
1 Percent City Sales Tax Fund	$6,292,000	$13,022,000	$13,694,000	$33,008,000
Street Light Utility Fund	$2,648,000	$5,478,000	$5,759,000	$13,885,000
Total	**$20,945,750**	**$43,339,750**	**$45,569,000**	**$109,854,500**

Table 12: Burleigh County

Program	Short Term (2029–2033)	Mid-Term (2034–2042)	Long Term (2043–2050)	Total
County Road and Bridge Fund	$58,091,000	$148,812,000	$177,842,000	$384,745,000
Highway Distribution Tax Fund	$31,062,000	$79,576,000	$95,100,000	$205,738,000
Total	**$89,153,000**	**$228,388,000**	**$272,942,000**	**$590,483,000**

Table 13: Morton County

Program	Short Term (2029–2033)	Mid-Term (2034–2042)	Long Term (2043–2050)	Total
County Road and Bridge Fund	$13,595,000	$28,134,000	$29,586,000	$71,315,000
Unorganized Road Fund	$5,423,000	$11,221,000	$11,791,000	$28,435,000
Highway Distribution Tax Fund	$30,772,000	$63,691,000	$66,971,000	$161,434,000
Total	**$49,790,000**	**$103,046,000**	**$108,348,000**	**$261,184,000**

Operations and Maintenance Funding

Operations and maintenance (O&M) costs represent a significant financial obligation for the MPO's partner agencies in the region because they are required to continually invest in the preservation of existing transportation assets. Activities funding through O&M includes winter maintenance, street sweeping, street maintenance, and labor costs associated with the administration and engineering of these activities.[13] Agencies in the region that are responsible for programming O&M funds include Bismarck, Mandan, Burleigh County, Morton County, and NDDOT.

Sources of O&M Funds

Several sources provide O&M funds for the agencies in the MPO area; they are summarized in **Table 14**.

Table 14: Sources of Operations and Maintenance Funds by Agency

Agency	Funding Sources
City of Bismarck	Intergovernmental Revenues, Charges for Services, Other Income, General Fund, Sales Tax, SW Disposal, Sales of Assets/Expenses, Snow Gates, Forestry
City of Mandan	Highway Distribution Tax
Burleigh County	Highway Gas Tax, Mill Levy
Morton County	Mill Levies, State and Federal Funding, Gas Tax

Source: Bismarck-Mandan MPO, *FY2024 – 2027 Transportation Improvement Program*

Historic O&M Funding

Historic O&M funds, including revenues and expenditures, for the MPO region were analyzed to understand the funding trends experienced by each agency during the years 2017–2024.

Historic O&M Revenues

O&M revenues received by NDDOT, Bismarck, and Mandan, as well as Burleigh and Morton Counties, for the years 2017–2024 are shown in **Table 15**.

O&M revenues for NDDOT saw an overall decline between 2017 and 2024, with revenues averaging roughly $2.5 million per year. Bismarck's O&M revenues during this period fluctuated from a high of $11.9 million in 2022 and a low of $2 million in 2019, which resulted in an average annual O&M revenue level of approximately $6.1 million. Burleigh County O&M revenues saw a large decline from 2017 through 2024, averaging nearly $2.7 million during this period. Mandan's O&M revenues increased annually from $362,157 in 2017 to $1.7 million in 2024 while averaging $1.3 million annually. Morton County O&M revenues displayed a similar trend to Bismarck's, experiencing substantial fluctuations on an annual basis while averaging almost $3.4 million per year between 2017 and 2024.

Historic O&M Expenditures

O&M expenditures for NDDOT, Bismarck, and Mandan, as well as Burleigh and Morton Counties, incurred in the years 2017–2024 are shown in **Table 16** and are shown to match the historic O&M revenues shown in **Table 15**. Given the match of historic O&M revenues with historic O&M expenditures, it is assumed that NDDOT and the LPAs in the MPO region program their O&M expenditures to match the estimated amounts of revenue available on an annual basis.

[13] Bismarck-Mandan MPO, *FY2024–2027 Transportation Improvement Program*

Table 15: Historic Operations and Maintenance Revenues, 2017–2024

Year	NDDOT	City of Bismarck	Burleigh County	City of Mandan	Morton County
2017	$2,697,468	$3,858,070	$7,252,597	$362,157	$8,343,000
2019	$2,386,172	$2,029,973	$989,387	$373,022	$25,000
2020	$2,481,619	$7,070,730	$5,263,609	$1,755,062	$753,464
2021	$2,481,619	$5,690,839	$1,186,766	$1,846,064	$671,350
2022	$2,386,172	$11,851,004	$1,106,909	$1,604,600	$6,640,771
2023	$2,386,172	$9,382,181	$1,395,000	$1,598,844	$6,450,000
2024	$2,386,172	$2,605,000	$1,508,832	$1,707,588	$816,000
Total	$17,205,394	$42,487,797	$18,703,100	$9,247,337	$23,699,585
Average	$2,457,913	$6,069,685	$2,671,871	$1,321,048	$3,385,655

Source: Bismarck-Mandan MPO, *FY2017–FY 2024 Transportation Improvement Programs*

Table 16: Historic Operations and Maintenance Expenditures, 2017–2024

Year	NDDOT	City of Bismarck	Burleigh County	City of Mandan	Morton County
2017	$2,697,468	$3,858,070	$7,252,597	$362,157	$8,343,000
2019	$2,386,172	$2,029,973	$989,387	$373,022	$25,000
2020	$2,481,619	$7,070,730	$5,263,609	$1,755,062	$753,464
2021	$2,481,619	$5,690,839	$1,186,766	$1,846,064	$671,350
2022	$2,386,172	$11,851,004	$1,106,909	$1,604,600	$6,640,771
2023	$2,386,172	$9,382,181	$1,395,000	$1,598,844	$6,450,000
2024	$2,386,172	$2,605,000	$1,508,832	$1,707,588	$816,000
Total	$17,205,394	$42,487,797	$18,703,100	$9,247,337	$23,699,585
Average	$2,457,913	$6,069,685	$2,671,871	$1,321,048	$3,385,655

Source: Bismarck-Mandan MPO, *FY2017–FY 2024 Transportation Improvement Programs*

Forecasted O&M Funding

Future O&M revenues for NDDOT, Bismarck, and Mandan, as well as Burleigh and Morton Counties, were forecasted based on the historic O&M funding levels shown in the MPO's TIPs for the years 2017–2024.

O&M Funding Forecast Growth Rate

The growth rate used to forecast future O&M funding levels utilizes the same 4 percent annual growth rate that was identified in the 2024–2027 TIP published by the MPO to estimate anticipated O&M revenues and expenditures for the years 2025–2027.

The future forecasted O&M funding levels were organized into the same time bands identified for future forecasted funding levels for the MPOs programs as shown in the **Future Forecasted Revenue Levels** section.

Forecasted O&M Revenues

Forecasted O&M revenues for NDDOT and the MPO's LPAs are shown in **Table 17**. Based on the 4 percent annual growth rate assumed for future O&M revenues, NDDOT is anticipated to receive a total of $102.2 million in O&M revenues between the years 2028 and 2050, with approximately $15.1 million received in the short-term period, $36 million in the mid-term, and $51.1 million in the long term. Bismarck's future O&M revenues were forecasted to equal approximately $111.6 million through the life of Arrive 2050, with $16.5 million in O&M revenues in the short term, $39.2 million in the mid-term, and $55.8 million in the long term. Burleigh County is expected to receive $64.6 million in O&M revenues, with $9.6 million forecasted for the short term, $22.7 million in the mid-term, and $32.3 million in the long term. Mandan's O&M revenue forecasts amount to $73.1 million through 2050, with a total of $10.8 million in short-term O&M revenues, $25.7 million in the mid-term, and $36.6 million in the long term.

Morton County is anticipated to receive a total of roughly $35 million in future O&M revenues, with $5.1 million expected in the short term, $12.3 million in the mid-term, and $17.5 million in the long term.

The overall amount of future O&M revenues for the MPO area was forecasted to amount to $386.5 million between 2028 and 2050. Short-term O&M revenues equate to $57.2 million, while mid-term O&M revenues were forecasted to equal $135.9 million, and long-term O&M revenues are expected to equal $193.4 million.

Forecasted O&M Expenditures

Forecasted O&M expenditures for NDDOT and the MPO's LPAs are shown in **Table 18**. It was assumed that O&M expenditures would follow the same trend observed for historic O&M expenditures in which total expenditures match total forecasted O&M revenues. As such, the future forecasted O&M expenditures match the amounts shown in **Table 18** for NDDOT's and each LPA's future forecasted O&M revenues.

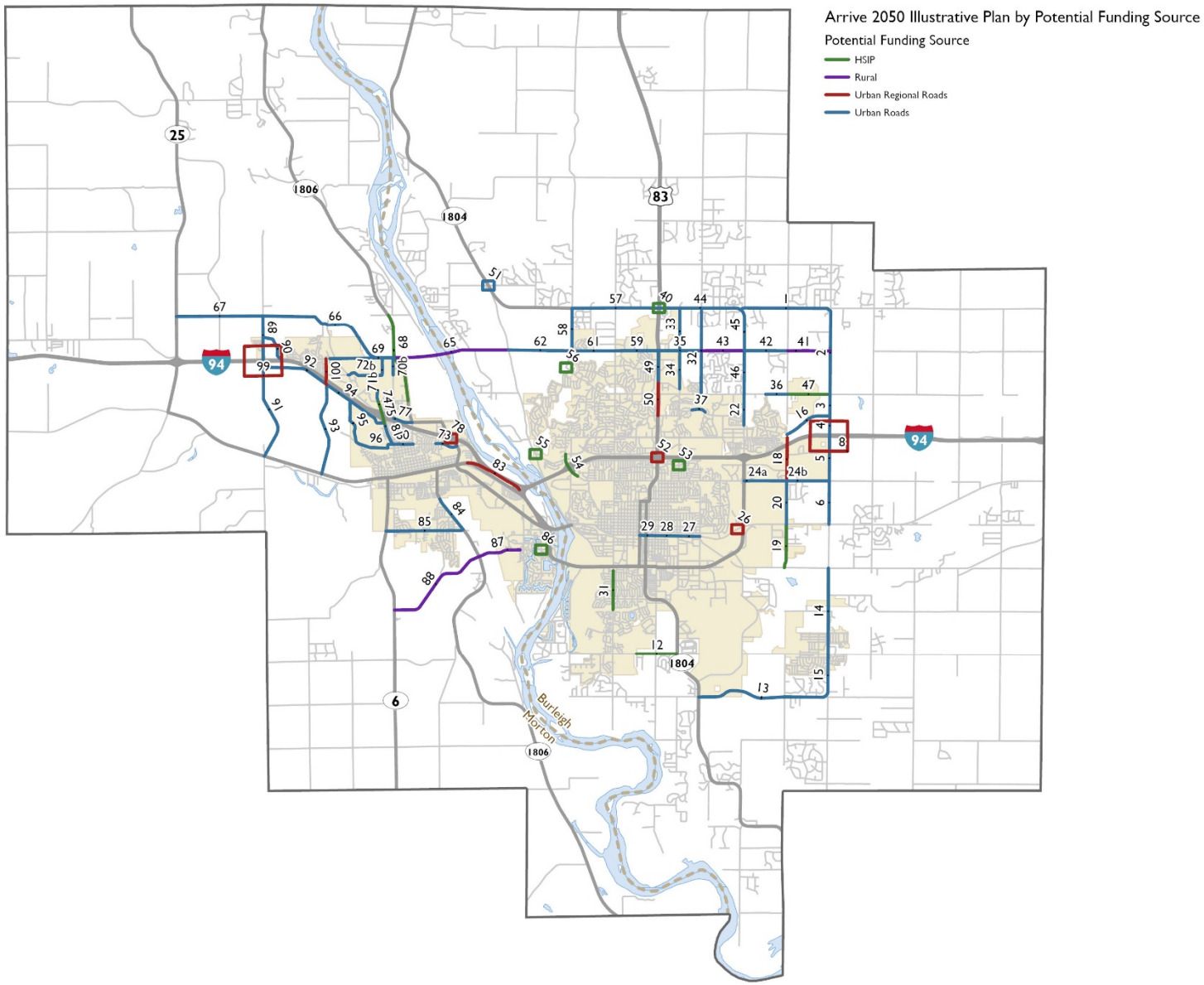
Table 17: Forecasted Operations and Maintenance Revenues

Time Band	NDDOT	City of Bismarck	Burleigh County	City of Mandan	Morton County	Total
Short Term (2028–2032)	$15,119,000	$16,505,000	$9,559,000	$10,821,000	$5,172,000	$57,176,000
Mid-Term (2033–2041)	$35,949,000	$39,232,000	$22,720,000	$25,712,000	$12,285,000	$135,898,000
Long Term (2042–2050)	$51,163,000	$55,829,000	$32,336,000	$36,598,000	$17,478,000	$193,404,000
Total	$102,231,000	$111,566,000	$64,615,000	$73,131,000	$34,935,000	$386,478,000

Table 18: Forecasted Operations and Maintenance Expenditures

Time Band	NDDOT	City of Bismarck	Burleigh County	City of Mandan	Morton County	Total
Short Term (2028–2032)	$15,119,000	$16,505,000	$9,559,000	$10,821,000	$5,172,000	$57,176,000
Mid-Term (2033–2041)	$35,949,000	$39,232,000	$22,720,000	$25,712,000	$12,285,000	$135,898,000
Long Term (2042–2050)	$51,163,000	$55,829,000	$32,336,000	$36,598,000	$17,478,000	$193,404,000
Total	$102,231,000	$111,566,000	$64,615,000	$73,131,000	$34,935,000	$386,478,000

Appendix F: Regional Illustrative Project List


Arrive 2050 Illustrative Plan by Potential Funding Source
Potential Funding Source
HSIP
Rural
Urban Regional Roads
Urban Roads
25
1806
1804
83
94
6
Burleigh
Morton

Appendix G – Trends and Drivers

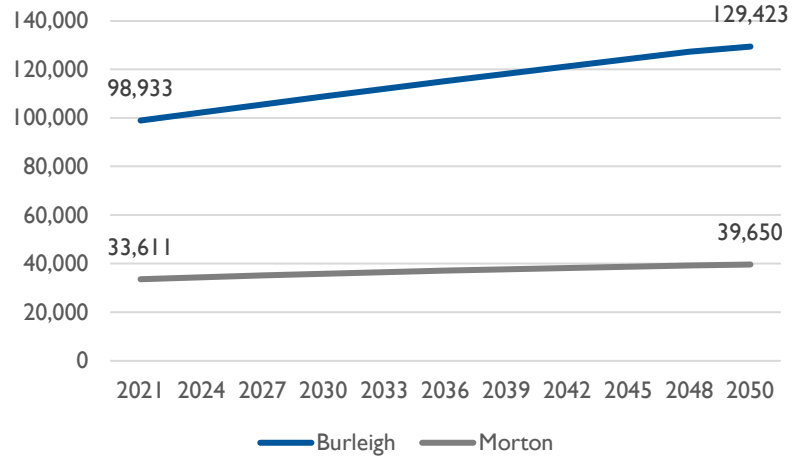
Bismarck-Mandan Socioeconomic Trends

Population Growth

Population growth for the Bismarck-Mandan region was calculated based on current population levels and forecasted 2050 population levels, which took birth, death, and migration rates into account.

As shown in **Figure 57**, the population for both Burleigh and Morton Counties is expected to steadily increase through 2050.

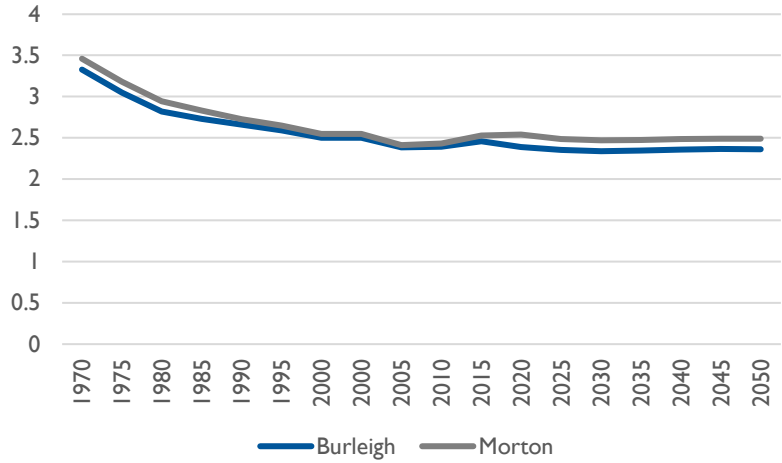
Figure 57: Woods & Poole Population Projections, 2021–2050



Household Growth

Population through 2050 was allocated to households based on average household size and was developed through analyzing factors such as housing type and age of structure. Average household size experienced a decline in the late twentieth century but stabilized around 2015. Average household size is expected to experience a minor decrease and then remain mostly stable through 2050, as shown in **Figure 58**.

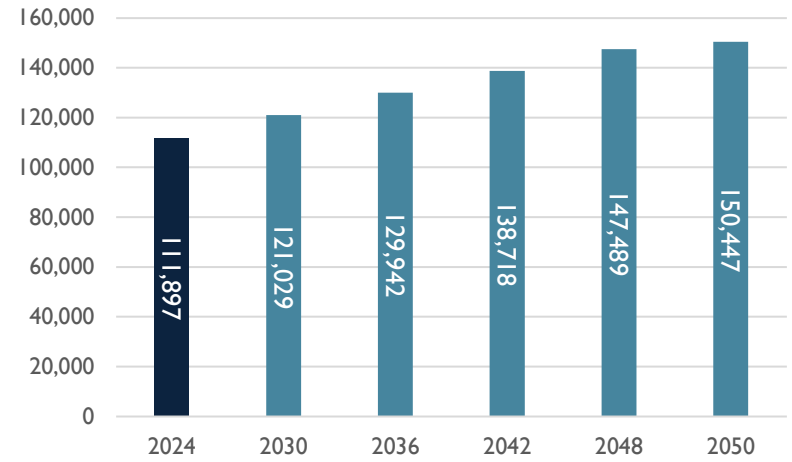
Figure 58: Woods & Poole Household Size Projections, 1970–2050



Employment Growth

Employment is expected to grow by 1.1 percent per year through 2050, producing roughly 38,500 jobs, for a total of an estimated 150,447 jobs. This is a slightly lower forecast than the previous forecast, of 1.8 percent annual growth in employment. The sector projected to see the most growth is health care and social assistance, followed by retail trade. Overall, employment is expected to steadily increase through 2050, as **Figure 59** indicates.

Figure 59: Current and Projected Employment, 2024–2050



Source: Woods & Poole

Changing Travel Patterns

Since the COVID-19 pandemic in 2020, telework and hybrid work models have created a significant shift in residential and commuting patterns. Due to more flexible work schedules, transportation demand during usual commuting hours has decreased and, in some instances, has shifted to other times of the day. Not only has the commuting landscape changed, but other transportation methods have become increasingly popular, such as rideshare and micromobility.

Out of the employed residents in Bismarck-Mandan in 2019, 3.9 percent worked from home, according to American Community Survey data. In 2022, a post-COVID year, residents who worked from home increased to 6.9 percent, demonstrating the significant shift in typical commuting patterns.

Additionally, an increasing reliance on internet connectivity for telework has seen greater demand for internet access and greater use of internet-connected mobile devices and mobile applications that allow for micromobility options, such as scooter share and bikeshare. Currently, BisParks BCycle is available as a bikeshare option in Bismarck, and Bird is an option for scooter share.

Technology

Almost 25 years into the twenty-first century, technology looks drastically different from technology at the beginning of the century. It is difficult to predict how technology will evolve over the next 25 years and how it will influence transportation. In recent decades, most progress has been made in connectivity, data analytics, digitization, and the emergence of artificial intelligence.

The adaptation of technology is occurring at a fast pace as well, which can be seen through the rapid adoption of EVs, autonomous and connected vehicles, and the use of ITS. With the assistance of new information from ITS, transportation agencies can better leverage the changing pace of how people and goods travel.

ITS

ITS allows communication between vehicles and nearby infrastructure. The use of loop detectors, cameras, and fiber optic interconnect can improve the efficiency, safety, and reliability of the transportation network. The Bismarck-Mandan MPO maintains a regional ITS architecture to coordinate funding and operations of ITS in the region. The architecture was updated in 2021 and will be updated again 2025. The ITS architecture is a useful local tool to identify areas where new technology could be implemented to improve safety and travel reliability and reduce congestion.

How Technology Will Impact Travel

Automotive travel became popular in the early twentieth century with the emergence of personal automobiles and led to land use policies that encouraged the use of automobiles over other modes. The development of the Bismarck-Mandan region reflected these

policies, which has resulted in low modal shares of walking, biking, and transit. However, the emergence of new technologies could change the landscape for how people choose to travel and create more sustainable methods of travel. The use of big data, which are large and complex datasets such as anonymized location-based service data, and cell phones to navigate and find transportation has already brought substantial change to how people travel today versus 25 years ago.

While there are many ways technology could evolve and influence travel between today and 2050, the main changes anticipated are discussed in the following sections.

Increased Electric Vehicles on the Road

In 2023, 1 in 10 cars sold in the United States was an EV, and EV registrations increased more than 40 percent compared to 2022[20]. As the trend toward electrifying automobiles continues, other modes are beginning to see electrified fleets, such as buses, bikes, and freight vehicles.

Automatic and Connected Vehicles

Policies for autonomous vehicles (AVs) and connected vehicles (CVs) have evolved quickly in recent years as additional research and implementation of these technologies continues. Most new vehicles on the market today come equipped with lane detection and precollision braking to increase vehicle safety. However, these vehicles rely on infrastructure on roadways, such as visible lane markings and ITS infrastructure, to be effective. Although many agencies are preparing to adopt AVs and CVs, the associated externalities, such reduced employment demand for freight operators and taxi drivers, are still not known. Job growth could ensue because of greater implementation of AVs and CVs in vehicle fleets through vehicle operator positions and other support jobs.

North Dakota, like many other states, is exploring regulatory changes to integrate AVs and CVs throughout the state. These policies and regulations are supported, although additional research on data use and ownership, insurance, registration, and licensing laws is needed.

Shared Vehicles

Ridesharing services have taken off in recent years and are now seeing daily use across the country, with some users relying on these services for their daily commute. Just as rapidly as ridesharing and other micromobility services emerged, new forms of personalized transportation services can take shape. Some newer forms of these services are still under development, such as automated shuttles, microtransit, advanced air mobility, and the use of drones. However, trends and investment toward high-speed rail and other mass transit could surpass the use of personalized rideshare or micromobility services.

More Transportation Choices

As autonomous, connected, electric, and shared vehicles become increasingly popular, transportation choices will become more diverse. Additionally, more forms of not only moving people but goods are emerging, such as the use of robots or drones for delivery methods.

Other Emerging Trends and Technologies

There are other external factors beginning to impact transportation that may have a lasting effect. Artificial intelligence (AI) has begun to take root in everyday life, ever since the public release of generative AI tools and the use of machine learning across various state

[20] International Energy Agency, Trends in Electric Cars, https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars

departments of transportation. AI has been used for transportation purposes, such as intelligent traffic management and improving system performance.

Additionally, due to the flexibility of work schedules in a post-pandemic economy, technology has begun to replace trips. Workers are increasingly opting out of in-person meetings to hold them virtually to avoid travel and save costs. As mentioned previously, a significant decrease in commuting-to-work trips can be seen, as many workers continue to work remotely from their homes.

The use of AI and the increasing reliance on technology for telework demonstrate the widespread use of technology today and how dependence on technology will only increase in the future. It is difficult to anticipate exactly what new technologies may influence travel in the future, but it can be expected that the use of technology will not go away.

Climate Change

More frequent and severe weather events across the globe have been attributed to a warmer climate, which will continue to worsen with increasing levels of carbon dioxide in the atmosphere. Since 1990, the Federal Emergency Management Agency has declared 47 weather-related disasters in North Dakota. Most of these disasters include flooding, severe storms, and severe winter storms, all of which have a large impact on transportation infrastructure.

Transportation agencies are facing increasing pressure to address resiliency in their networks, especially considering an increase in flooding events and extreme temperatures every year. The transportation sector is the largest contributor of greenhouse gas emissions in the United States, making up about 28 percent of total emissions[21]. These emissions are continuing to worsen the climate change issue, and the dependence on personal automobile travel is exacerbating the effects of climate change. Transportation agencies across the country are supporting reductions in greenhouse gas emissions by increasing accessibility to alternative transportation modes, such as buses and micromobility options, and supporting bicycle and pedestrian infrastructure.

Safety Trends

In the past decade, there has been a national effort toward improving safety on roads. The USDOT has adopted a Safe System Approach to provide a holistic guide for transportation agencies to help prevent crashes and minimize the harm of crashes that do occur. Many cities are adopting "vision zero" plans to aim for zero traffic deaths by a certain target date.

Additionally, with increased distracted driving and high speeds, serious injury and fatality crashes are more likely to happen. Many transportation agencies are adopting a Safe System Approach to make travel safer and to abide by federal performance measures. These safety measures apply to all road users, including bicyclists and pedestrians.

State and Federal Policy Funding

The federal government has made strong commitments to investing in transportation and improving infrastructure through IIJA, which was signed into law in 2021. The IIJA includes investment for improving roads, bridges, and rails, including the largest federal investment in passenger rail since Amtrak was created. These projects have a focus on resiliency, equity, and safety, as well as reducing greenhouse gas emissions.

North Dakota can expect to receive $1.9 billion over 5 years in federal highway formula funding for highways and bridges. An

[21] U.S. Environmental Protection Agency, *Carbon Pollution from Transportation*

additional $13 billion will be invested in roadway safety across the state. IIJA has a large focus on providing funding specifically to promote equity and environmental justice across the nation. The funding provided for repairing and rebuilding infrastructure is geared toward equity and environmental justice by focusing on populations who have historically faced the disproportionate impacts of climate change. For example, North Dakota will receive an estimated $110 million over 5 years to provide more sustainable transportation options for North Dakotans and facilitate travel for all.

Funding Sources

Changes in federal and state policies could impact the priorities and investments of Bismarck-Mandan in future years. Federal transportation legislation in recent years has required state departments of transportation and MPOs to track performance metrics and reach goals set forth in their planning documents. MPOs must also start addressing resiliency, travel and tourism, and housing in their transportation plans and studies. Adherence to these guidelines and future changes could affect federal funding that MPOs receive.

Gas Tax and Motor Fuel Taxes

As vehicles become more fuel efficient, federal and state motor vehicle tax revenues have started to plateau and may decrease, which could lead to a shortage of funds in the Federal Highway Trust Fund. Transportation agencies may have to rely on other funding sources, such as a VMT fee, or may have to begin relying on discretionary grant programs. Improved fuel efficiency and the increasing use of EVs and alternative fuels may drastically reduce funding sources for MPOs, which may lead to a shift in federal or state revenues and could cause a change in funding policies.

Summary of Trends and Technologies

Changes in travel patterns and increasing reliance on technology to support transportation have led to increased choices and mobility for people and goods. The main trends and technology changes affecting transportation include the following:

- **More** automatic, connected, electric, and shared vehicles,
- **Investments** toward carbon reduction in transportation,
- **Increased focus** on safety and reducing injuries and fatalities,
- **Additional funding** opportunities to promote resilient and sustainable transportation.

To accommodate changing travel needs and choice of transportation mode, local jurisdictions may have to consider how to adopt some of the trends mentioned above into the local transportation network.